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The Relationship between Self-Reported Cancer Pain and Personality in Black and White Older Adults receiving Outpatient Cancer Care

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The Relationship between Self-Reported Cancer Pain and Personality in Black and White
Older Adults receiving Outpatient Cancer Care

by

Jessica L. Krok

A dissertation submitted in partial fulfillment
of the requirement for the degree of
Doctor of Philosophy
School of Aging Studies
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DEDICATION

This dissertation is dedicated to my family and friends who have inspired me and encouraged me throughout this process. I would like to thank my wonderful family- Dad, Mom, Kathy, Jen, Jamie, David, and Kasey for your endless support. Thank you Mom for teaching me to not shy away from new opportunities and to relish in this experience. Thank you Dad and Kathy for making me feel like home was closer than ever and that it's exciting to not have a direct path in life. Jen and Jamie, thank you for your support throughout this process and all of the airport pickups, rides back to Hubbard, and stays at Casa de Rehm. Jen, your excitement regarding my postdoctoral opportunities made my decision much easier and exciting. Jamie and David, thanks for keeping in the loop with music while I was busy in school. Kasey, your awesome letters made the distance between us feel much shorter.

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ABSTRACT

It is well-established that personality not only affects physical health and longevity, but also mental health and coping mechanisms. One area of limited research is the relationship between cancer pain and personality. This study examined how personality traits affect reported cancer pain severity in older patients ($N = 150$) receiving outpatient treatment at a comprehensive cancer center. Participants were interviewed regarding their pain severity, personality, affect, and self-efficacy for pain management. Symptom data were collected from the Brief Pain Inventory, while personality data were gathered from the Ten Item Personality Inventory and the Positive and Negative Affect Schedule. Self-efficacy for pain management was collected from the Chronic Pain Self-efficacy Scale. Analyses included descriptives, Chi-square tests, t-tests, stepwise linear regressions, and moderation analyses. The mean age of the sample was 65.38 ± 7.72 years. Seventy-nine percent of the sample was White. Analyses indicated that the average pain was 4.15 ± 2.01 (0-10 scale; with 10 being worst pain), with the sample recording means of 6.53 ± 2.57 and 2.45 ± 2.15 on worst and least pain, respectively. Regression analyses showed extraversion ($\beta = -0.21, p < .01$) and openness to experience ($\beta = 0.18, p < .05$) to be significant predictors of higher current and average pain severity, respectively. Agreeableness ($\beta = 0.18, p < .05$) was found to be a significant predictor of higher self-efficacy for pain management. Conscientiousness and extraversion were significant moderators in the relationship between self-efficacy for pain management and

worst pain severity. These findings indicate that different personality types and personal affect may influence reports of pain severity. More empirical research is needed to understand the impact of personality and its relationship with pain severity and self-efficacy for pain management in more diverse and marginalized cancer populations across the age continuum. Finally, the results may be used to design more individualized interventions on pain management, depending on personality type, an application that has never been done in older adults with cancer.

CHAPTER ONE: INTRODUCTION

This dissertation is timely in that the prevalence of cancer is increasing. In 2011, there are an estimated 1,596,670 new cancer cases in the United States alone, and these numbers are expected to increase drastically over the next two decades (American Cancer Society, 2012). From 2010 to 2030, the projected cancer incidence will increase by 45% from 1.6 million to 2.3 million people (Smith et al., 2009). The risk of being diagnosed with cancer increases with age. About 78% of all cancers are diagnosed in persons aged 55 years and older. Half of all men and one-third of all women in the U.S. will develop cancer during their lifetime (American Cancer Society, 2012).

It is critical that attention is brought to the future increase in cancer diagnoses in older Whites and Blacks. Blacks often experience disproportionate death rates from various cancer sites. For example, Blacks have the highest death rate and the shortest survival of any racial and ethnic group in the U.S. for most cancers. In 2007, the death rate for all cancers combined were 32% higher in Black men and 16% higher in Black women than in their white counterparts (American Cancer Society, 2012).

This racial disparity in cancer death rates will continue with the growth of minority populations. In the United States, minority populations are expected to increase from 83 million in 2000 to 157 million in 2030 and experience more than 100% increase in cancer incidence by 2030 (Erikson et al., 2007; Smith et al., 2009). This increase in minority populations will have a significant impact in cancer care ranging from prevention, detection, diagnoses, and treatment particularly because minorities have

disproportionately higher prevalence rates of cancer and lower cancer survival rates when compared to Whites (American Cancer Society, 2012; Bradley, Given, & Roberts, 2001; Green et al., 2003; Gross, 2008; Haynes & Smedley, 1999).

In addition to the risk of death, cancer may result in pain. Experienced by approximately 50% of all oncology outpatients, and 80-90% of those diagnosed with metastatic cancer, pain has been shown to compromise one's quality of life, social psychological well-being, and related distress (Curtis, Kretch, & Walsh, 1991; Harrison, Young, Price, Butow, & Solomon, 2009). Treating and managing pain is crucial to the patient's quality of life. However, little is known about the overall cancer-related pain severity and the psychosocial factors (i.e., personality, self efficacy, social functioning) that influence the occurrence of reported cancer pain in older adults especially in Black older adults (McGuire, 2004).

Personality and health is a growing field in psychology and behavioral medicine. The Biologic Interactional Theory (Smith & Anderson, 1986) attempt to disentangle the ways personality can influence health including cancer pain. It is well-established that personality not only affects physical health and longevity, but also mental health and coping mechanisms (Calabrese et al., 2006; Mroczek & Spiro, 2007; Ramirez et al., 2004). Special attention should be given to vulnerable populations such as minorities, cancer patients, and the elderly to explore various interactions of health and personality in multiple settings. Future research should explore the feasibility of individualized medicine while using a multidisciplinary approach to identify any unique factors of diverse research samples.

The dissertation is organized as an individual study with an overarching goal of understanding the relationship/impact of personality and cancer pain severity of older White and Black cancer patients. The dissertation begins with a literature review (Ch.2) that includes research on cancer pain, cancer pain treatment disparities, and the relationship between reported pain and personality. Following the literature review, research questions, methods, and analyses (Ch. 3) are discussed. Chapter Four describes all of the results from the three research questions. The last chapter, (Ch. 5) discusses study results, study limitations, future directions, and a conclusion. A glossary of key terms can be found in Appendix 1.

CHAPTER TWO

The following chapter begins with the current literature on cancer pain treatment. I then review the literature about disparities in access to adequate cancer pain care among older adults and those older adults from diverse race populations. Following the section on cancer disparities, I then discuss the various patient barriers to receiving adequate health care and pain treatment. From there, the focus shifts to include a review of the current literature of the relationship between cancer and cancer-related pain, personality, self-efficacy, and coping. I close with a review and discussion regarding the influence of race and age in understanding the relationship between personality, cancer-related pain, and cancer.

Background

The treatment of cancer in older adults presents daunting challenges for health care professionals who must consider age-related physiological changes, the pre-existing comorbidities, declines in functional ability, and complex symptoms (Blank & Bellizi, 2008; Hadjistavropoulos et al., 2007; Stavrou, Lu, Buckley, & Pearson, 2012). In addition, pharmacological therapies for cancer-related pain in the elderly differ in effectiveness from younger cancer patients due to age-related changes in metabolism and large quantity of prescribed medications (Gloth, 2001; Janora, Jermyn, & Surve, 2010). Furthermore, the older population is more likely to suffer from other chronic illnesses, such as arthritis, that may elicit a pain response (Jansen, 2008). These factors are imperative for consideration by oncologists and geriatricians who provide cancer treatment to older adults. Although there is an increased focus on pain and why it is too

often ineffectively treated, the undertreatment of pain is observed in some groups more than others. Patient factors, in particular race, have been shown to contribute to differences in pain treatment (Bonham, 2001; Fisch et al., 2012; Vallerand, Hasenau, Templin, & Collins-Bohler, 2005).

Studies have found Black and Hispanic cancer patients are less likely than Whites to have their cancer pain recorded, report pain relief, and receive pain treatment and pain management in the form of analgesics and education-based interventions (Anderson et al., 2002; Cleeland et al., 1994; Fisch et al., 2012; Green & Hart-Johnson, 2010). More than 20 years ago, Cleeland et al. (1994) found that minority patients were three times more likely to have inadequate pain medications compared to non-Hispanic Whites. A recent study found a similar trend with the rates of inadequate analgesic prescribing for minority patients double that of non-Hispanic Whites (Fisch et al., 2012). Explanations for these disparities in pain recognition and treatment by analgesics range from inadequate assessments to institutional racism (Murthy, Krumholz, & Gross, 2004; Smith et al., 2009; Williams & Jackson, 2005).

Pain and Pain Treatment

Pain, while highly variable and subjective, has been identified as one of the most common symptoms in patients with cancer (Gordon et al., 2005; McMillan, Tofthagen, & Morgan, 2008; Stark, Tofthagan, Visovsky, & McMillan, 2012; Stromgren et al., 2006). Three main types of cancer pain, acute, chronic, and breakthrough pain, are present in 20-75% of adult patients at diagnosis and in 17-57% of the patients undergoing treatment (Miaskowski et al., 2006).

Acute pain is short in duration and typically manifests in ways that can be easily described and observed. Acute pain may be caused by many events including broken bones, burns, and surgery. It may last for several days, increasing in intensity over time (subacute pain), or occur intermittently (Jansen, 2008). In most cases, acute pain does not last longer than six months, and it ceases to exist when the underlying cause of pain has been treated or has healed. Unrelieved acute pain, however, may lead to chronic pain (Cleveland Clinic, 2008).

Chronic pain refers to pain that lasts for more than three months. Chronic pain may originate from a trauma (car accident) or there may be an ongoing cause of pain (cancer pain) (Cleveland Clinic, 2008). According to the American Cancer Society, chronic cancer pain often involves both persistent pain and breakthrough pain, making it difficult to describe and treat. Persistent pain is continuous and may last all day (American Cancer Society, 2012). Breakthrough pain is defined as intermittent exacerbations of acute pain that may occur spontaneously or in relation to specific activity, often on a background of well-controlled chronic pain (Abrahm, 2005; U.S. Department of Health and Human Services, 1994).

The treatment of cancer including surgical procedures, bone marrow biopsies, chemotherapy, radiation, and lengthy x-ray procedures may cause discomfort in addition to the pain associated with the cancer and any other preexisting chronic conditions (Hadjistavropoulos & Hadjistavropoulos, 2008). Because of these multiple treatments and causes of pain, persistent and undertreated pain is a major concern for cancer patients. In order to provide a simple, yet highly effective, method for the relief of cancer pain, the World Health Organization (WHO) developed a three step administration of

pain medication with individualized medication adjustment (1986, 1996). The first step to the administration of pain medication is a non-opioid. If it does not relieve the pain, an opioid for mild to moderate pain is added in addition to the non-opioid. When a non-opioid and opioid for mild to moderate pain fails to relieve patient pain, then an opioid for moderate to severe pain should be substituted (World Health Organization, 1996). Despite these guidelines, cancer pain management is still inadequate (Fisch et al., 2012).

A national study by Fisch et al. (2012) reported that 33% of cancer patients with pain had inadequate analgesic prescribing for cancer pain treatment. In addition, physicians reported inadequate training in pain management skills (Donovan, Thompson, & Jacobsen, 2012; Silvonemi et al., 2012). According to previous studies, the physicians' self-assessment of cancer pain treatment skills was poor (Pflughaupt et al., 2010; Silvonemi et al., 2012). Additional physician and patient education about multiple causes of pain, assessment of pain, and pain treatment with pain analgesics could lead to better pain management and fewer reports of underestimated and unresolved cancer-related pain (Silvonemi et al., 2012).

Older Adults and Cancer Pain

About 77% of all cancers are diagnosed in persons 55 years of age and older (American Cancer Society, 2012). Although cancer is primarily a disease affecting older people, there is a lack of research focused on the occurrence of cancer pain in older adults (Caltagirone, Spoletini, Gianni, & Spalletta, 2010; Eyigor, Eyigor, & Uslu, 2010; McGuire, 2004; Shea & McDonald, 2011). In older cancer patients, pain prevalence ranges from 14-100%, with higher percentages in advanced stages (National Institutes of

Health, 2003). Given that approximately 70% of cancer-related deaths occur in patients over the age of 65, older patients have the highest risk of experiencing cancer-related pain (Caltagirone et al., 2010; Costantini et al., 2009).

Studies on older adults and cancer-related pain have also explored the predictors of chronic cancer-related pain. Given et al., (2001) explored the predictors of pain in older adult patients with newly diagnosed breast, colon, prostate, or lung cancers. Study results showed that later stages of cancer, reporting more comorbidities, and lung cancer (as compared with breast, colon, and prostate) were predictive of pain.

Eyigor and colleagues (2010) found that the elderly patients did not have more pain than their younger counterparts and that physical functioning and fatigue were correlated with cancer-related pain in older adults. Cheung and Lee (2011) found that 49% of elderly cancer patients undergoing radiation and chemotherapy reported pain. They also found that pain, fatigue, insomnia, and mood disturbance together negatively influence the patients' functional health and quality of life. Aside from these limited data, little is known about the etiology, syndromes, or stage of cancer as they relate to the occurrence and composite experience of pain in elder patients (Caltagirone et al., 2010; McGuire, 2004). Further, the majority of these studies are limited to older White samples.

Older Minorities and Cancer Pain

Older minorities are at particular risk for cancer, cancer-related pain, and inadequate cancer pain management (McKoy et al., 2009). Although cancer-related pain has been recorded in all racial and ethnic groups, there is disparate use of analgesics to

treat and manage cancer-related pain among diverse race groups (Anderson, Green, & Payne, 2009).

Sixty-two percent of cancer patients who were members of minority groups who had pain had analgesics prescribed that were less potent than those recommended by the WHO guidelines and were three times less likely to receive analgesics their White counterparts (Green et al., 2003). One study reported physicians underestimated cancer-related pain severity for more than 50% of the Black and Hispanic patients and only underestimated pain severity in 23% of White patient counterparts (Anderson & Hussey, 2000).

A longitudinal study by Green and colleagues (2009) found that older non-Whites experienced more symptoms (fatigue, depression), higher chronic pain, higher breakthrough pain, increased pain interference, and lower health-related quality of life than older Whites. These results are consistent with findings from a study by Reyes-Gibby and colleagues (2012), which found more Hispanic and non-Hispanic Black patients with lung cancer reported significantly more severe pain than non-Hispanic Whites. These results demonstrate lingering disparities in the cancer pain experience.

Studies of racially diverse older adults and cancer pain management in a variety of environments are limited. Bernabei and colleagues found that between 25-40% of the elderly cancer patients in nursing homes experienced daily pain (Bernabei et al., 1998). These results correspond with a limited number of studies showing that 50-100% of elderly patients in nursing homes endure daily cancer-related pain (Caltagirone et al., 2010; Cheung & Lee, 2011; Cleeland, 1998; Stein & Miech, 1993). Twenty-six percent of the patients did not receive any analgesic, a trend which increased with age (Bernabei

et al., 1998). As seen in later studies, older minority patients were less likely than older White patients to have their pain recorded and receive analgesics (Castel et al., 2008; Green et al., 2003; Landi et al., 2001). The authors speculated that the undertreatment of older cancer patients (minority and non-minority) may be a result of inadequate assessments, physician underestimation of their pain, patient underreporting of pain, and communication difficulties between patient, nursing home staff, and physicians (Bernabei et al., 1998).

Community-dwelling older minorities are also at risk for lower quality health care and chronic pain compared to community-dwelling older Whites. Reyes-Gibby and colleagues found approximately 1 in 3 older adults reported pain, and that older Blacks and Hispanics reported higher severe pain than older non-Hispanic Whites (2007). They also identified having a chronic disease (such as cancer), psychological distress, being a Medicaid recipient, and having lower education levels as significant risk factors for chronic pain (Reyes-Gibby et al., 2007). The significant predictor of being a Medicaid recipient is especially important because it suggests inadequate pain management for low income individuals (Reyes-Gibby et al., 2007). These results suggested that the association between race and ethnicity and socioeconomic status may influence the receipt of cancer-related pain treatment.

Disparities in Cancer Treatment

Racial disparities have been demonstrated in the process and outcomes of cancer care (Gross, Smith, Wolf, & Andersen, 2008; Wells et al., 2011). A 2005 study by Baldwin and colleagues examined the degree to which physicians and health systems

explain the lingering disparities in the receipt of colon cancer care including pain management. They found that Black patients were more likely than their White counterparts to receive treatment from the youngest and oldest oncologists, those who were not board certified in internal medicine, those with the lowest private practice volumes, and those in solo practice. Instead of private practice, Black patients were more likely to receive care in teaching hospitals and hospitals with the highest volumes compared to Whites (Baldwin et al., 2005). In addition, Black patients were also significantly less likely to receive chemotherapy than White patients, with youngest Black Medicare beneficiaries experiencing the greatest disparity in receiving chemotherapy. Further, individuals of lower socioeconomic status (lower educational attainment, lower income) received the least amount of cancer treatment ranging from pain management to chemotherapy. These results not only suggested differences in cancer care among older White and Black patients, but also provided further evidence of cancer health disparities by age, race, ethnicity, and socioeconomic status (Baldwin et al., 2005).

A study by Gross and colleagues (2008) explored whether racial disparities across the cancer continuum had diminished over a ten-year period. Using the SEER-Medicare linked database, they found Black patients were less likely than Whites to receive therapy for lung, breast, colon, and prostate cancer. Further, there was no notable decrease in racial disparities in treatment over a 10-year period. The inability to reduce race disparities in cancer therapies is disappointing given the substantial attention to identifying and reducing racial disparities in cancer treatments including pain management (Gross et al., 2008; Printz, 2012).

Barriers to Cancer Treatment

Previous studies have also reported that health insurance status was an important factor in determining receipt of cancer prevention and screening services as well as access to timely diagnostic care and treatment for cancer (Bradley et al., 2001; Halpern et al., 2008). Uninsured individuals or those with Medicaid tended to use cancer screenings less frequently (Ioannou, Chapko, & Dominitz, 2003; Klabunde et al., 2011) and had more advanced cancer at diagnosis compared to patients who are privately insured (Bradley et al., 2001; DuBard, Schmid, Yow, Rogers, & Lawrence, 2008; Roetzheim et al., 1999). Patient, provider, and system level barriers underlie these disparities in cancer pain management and treatment (Morris, Rhoads, Stain, & Birkmeyer, 2010).

System Level Barriers to Pain Management

System level barriers related to the organization of health services and policy may influence the receipt of pain treatment (Smedley, Stith, & Nelson, 2002). Research has shown common barriers for adequate treatment of pain were inadequate staff assessment and reports and insufficient staff knowledge on pain treatments (Anderson & Hussey, 2000; Davis & Srivastava, 2003). Freeman and Chu (2005) found a decrease in staff members and upcoming medical professionals who specialize in pain. Finally, the fragmentation of pain treatment due to a lack of staffing, insurance coverage, and reimbursement costs was another barrier in the healthcare system (Smedley et al., 2002). Interventions targeted at the system level (improving access to health services, being

sensitive to vulnerable populations, and instituting system-level protections) are crucial for rectifying disparities in cancer pain management (McNeill, Reynolds, & Ney, 2007).

Other factors in addition to staffing may act as barriers to cancer pain management. Financial factors may hinder access to quality pain treatment (Halpern et al., 2008; Thorpe & Howard, 2003). Some of the many barriers may include insurance status, insurance coverage, co-pays, ability to pay for pain medications, transportation, time off work, child care, and traveling costs associated with the distance to cancer care (Freeman & Chu, 2005). Financial barriers to adequate cancer-related pain treatment are common for some older adults and minorities who are disproportionately reliant on Medicare and Medicaid for their health insurance (Alder & Rehkopf, 2008; Green et al., 2003; LaViest, 2005). Medicaid, state funded health insurance for the financially needy, is the largest provider of health insurance for minority populations in the U.S. (Llanos & Palmer, 2007). Members of ethnic minority groups are more likely to be uninsured or have Medicaid insurance than non-Hispanic Whites, both in the general population (DeNavas-Walt, Proctor, & Smith, 2011; Fronstin, 2006) and among those diagnosed with cancer (Halpern et al., 2008; Thorpe & Howard, 2003).

Provider Level Barriers to Pain Management

Provider level barriers related to the provider attitudes and skills may also influence the receipt of cancer pain treatment (Morris et al., 2010). Research has found inadequate pain assessment, provider stereotypes, and inadequate staff knowledge regarding pain management are the most common barriers for physicians in treating minority cancer patients (Anderson & Hussey, 2000). Previous studies have shown that

physicians often underestimated the severity of pain in minority patients (Anderson et al., 2000, 2009; Cleeland et al., 1997). This disparity is caused by a number of factors such as difficulties in provider-patient communication, inadequate pain measures, and the provider's own biases about patient's age or racial group (Anderson et al., 2000, 2009). Educating providers on pain management and cultural competence may help reduce disparities in pain treatment of minority cancer patients (Anderson et al., 2009).

Patient Level Barriers to Pain Management

The role of the patient may also help reduce or facilitate inadequate and unequal pain treatment. At times, patients may be reluctant to discuss their pain for several reasons including the desire to be a "good patient" and fear that the discussion will take time away from their cancer treatment (Jacobsen et al., 2009; Ward et al., 1993). Studies also have found a decrease in symptom reporting when patient/provider partnerships are *race discordant*. Race discordant relationships occur when the patient and provider are not the same race or ethnicity (McNeill et al., 2007; Tait & Chibnall, 2005). Nevertheless, it is important for patients to communicate that they are in pain because unrecognized pain is untreated pain (Cleeland, 1998).

Most research identifying patient-related barriers to pain management have studied primarily younger, non-Hispanic White cancer patient samples. While there are some similar concerns that limit pain management in non-minority and minority samples, numerous studies have identified significant differences in reported treatment concerns among racial and ethnic groups (Anderson et al., 2000, 2002; Cleeland et al., 1994, 1997; Im, 2007; Vallerand et al., 2005). Studies suggested several differences including non

adherence to prescribed analgesic regimens, difficulty accessing medications, patient knowledge and attitudes, fear of addiction, physician distrust, perceived racism, and perception of control (Anderson et al., 2002; Jacobsen et al., 2009; McNeill et al., 2007; Tait & Chibnall, 2005; Vallerand et al., 2005). Research on pain management may benefit by including other patient-related factors such as personality and affect (Calabrese, Lyness, Sorensen, & Duberstein, 2006; Dahl, 2010).

Personality

An area that is often understudied regarding patient-related factors to pain management is personality. Personality refers to an individual's enduring and pervasive motivation, emotion, interpersonal style, attitudes, and behavior (Dahl, 2010). Personality theory is largely dominated by the Five Factor Model (FFM), which consists of five domain-level personality factors: neuroticism, extraversion, openness to experience, conscientiousness, and agreeableness (Costa & McCrae, 1989). Neuroticism is comprised of several facets: anxiety, hostility, anger, depression, self-consciousness, vulnerability, moodiness, and impulsiveness. Individuals high in neuroticism often have irrational perfectionistic beliefs, pessimistic attitudes, and are easily upset (John, Naumann, & Soto, 2008). Extraversion includes facets such as gregariousness, assertiveness, activity, excitement-seeking, positive emotionality, and warmth. Individuals high in extraversion are often out-going, socially active, and energetic (John et al., 2008). Openness to experience features facets such as curiosity, insight, and imagination. Those high in this trait tend to have a range of interests, liberal values, and an appreciation for aesthetics. Conscientiousness includes high levels of thoughtfulness, with self-discipline and goal-

directed behaviors. Those high in conscientiousness tend to be organized and detail-oriented. Lastly, agreeableness includes facets such as modesty, conventionality, trust, altruism, kindness, honesty, and other prosocial behaviors (John, Robins, & Pervin, 2010; Costa & McCrae, 1989).

Personality and Cancer

Previous research on the relationship between the FFM of personality and cancer is minimal and inconsistent. The majority of research explored personality types (e.g., high neuroticism) acting as precursors to cancer onset and survival (Augustine, Larsen, Walker, & Fisher 2008; Friedman & Booth-Kewley, 1987; Terriacciano & Costa, 2004; Turiano et al., 2012; Weiss & Costa, 2005). For example, personality traits such as neuroticism were hypothesized to influence the frequency, duration, and/or intensity of physiological stress responses which, in turn, initiated or hastened the development of a disease (Augustine et al., 2008). A small number of studies that explored personality traits, health behavior, and cancer risk found no relationship between personality, health behaviors, and cancer (Butow et al., 2000; Hansen et al., 2005). However, these studies defined personality in a number of different ways and had inconclusive results.

A specific personality type that has a major impact on cancer incidence, health status, disease course and outcomes has not yet been defined (Mols et al., 2010). For now, a limited number of studies have begun to define the relationship among personality, physical health, and cancer (Augustine et al., 2008; Mols et al, 2010; Sharma, Sharp, Walker, & Monson, 2007).

A study by Aarastad and colleagues (2002) found that head and neck cancer patients currently receiving treatment had significantly higher neuroticism scores than patients with a non-malignant head or neck tumor. This finding is consistent with Amelang (1997) that suggested individuals diagnosed with cancer are likely to be higher in neuroticism relative to those without cancer. These findings contradicted results from Eysenck (1988) who hypothesized that neuroticism and extraversion act as protective factors against cancer. These different findings further demonstrate that the relationship between personality traits and cancer is inconclusive.

Augustine et al. (2008) added to the literature on personality and cancer by studying the age at which individuals received surgery for lung cancer. After controlling for risky health behaviors, neuroticism, anger, hostility, anxiety, and depression were associated with the onset of lung cancer. Moreover, results suggested that individuals with high levels of negative affect manifested lung cancer earlier in their lives. This study is supported by the previous research on personality and chronic disease and encourages more research regarding personality and cancer onset (Aarastad et al., 2002; Amelang, 1997).

Sharma and colleagues (2007) investigated how patient personality predicts postoperative stay and health status after colorectal cancer surgery. They found that patient length of stay (LOS) was positively correlated with high anger levels, a facet of neuroticism. Extraversion was also found to predict shorter LOS and higher pain tolerance.

Mols et al. (2010) explored whether melanoma survivors with Type D personality, a combination of negative affectivity (high neuroticism) and social inhibition

(low extraversion), reported similar health status, cancer impact, and health care utilization compared to those without Type D personality. They reported that Type D individuals had a significantly lower health status, social functioning, mental health, and less vitality than individuals without Type D personality traits. Furthermore, these Type D individuals reported higher distress associated with cancer, negative self-evaluation, and negative life outlook. No differences were found in health care utilization between Type D and non Type D individuals (Mols et al.).

Personality and Coping with Pain

An area that warrants further study is how personality influences the way individuals cope with physical stressors such as chronic pain. Research has largely explored optimism (e.g., generalized positive outcome expectancy) and neuroticism, in relation to multiple types and sources of pain (Dahl, 2010; Scheier & Carver, 1985). Regarding cancer pain, researchers have suggested that the experience and expression of pain are dependent on the patient's personality and that cancer patients experiencing pain have higher neuroticism (Dahl, 2010; Sullivan et al., 2001). Furthermore, optimism has been associated with lower reported pain severity, more active planning and acceptance, and lower social disengagement (Carver & Connor-Smith, 2010; Kurtz et al., 2008; Urcuyo et al., 2005).

Personality had been found to influence the frequency of exposure to stressors, the type of stressors experienced, and appraisals such as excessive physiological reactivity (Dahl, 2010; Van Heck, 1997; Vollrath, 2001). Data on the relationship between personality, demographics, perceived pain, and coping has shown that high

neuroticism was linked to passive coping strategies, allowing pain to adversely affect other areas of the subject's life (e.g., restricting social functioning) (Ramirez-Maestre, Martinez, & Zarazaga, et al., 2004). Furthermore, those with passive coping strategies reported higher pain intensity. High extraversion (i.e., prosocial functioning) was associated with lower pain intensity and predicted the use of active and effective strategies such as expressing feelings and seeking social support for handling pain (Ramirez-Maestre et al., 2004).

A study by Prasertsri, Holden, Keefe, and Wilkie also explored particular coping styles and personality traits that were related to pain and pain coping strategies in cancer outpatients (2011). Compared to other coping styles (high/low anxiousness), those that utilized repressive coping, which involves inhibiting negative feelings or unpleasant cognitions in order to prevent one's positive self-image from being threatened, reported less pain, pain catastrophizing, and fewer depressive symptoms (Prasertsri et al., 2011). The researchers concluded that assessing coping style by measuring personality characteristics such anxiety and neuroticism may help clinicians to identify individuals at particular risk for pain and depression.

Calabrese and colleagues (2006) showed that pain was associated with depression in older patients. Regarding personality, they found neuroticism moderated the association between pain and depression and the relationship was stronger in patients with lower neuroticism scores. The researchers speculated that people with higher neuroticism had lower pain thresholds. Clinicians should be encouraged to recognize this association between pain, depression, and individual variation in personality to ensure

quality pain management by identifying potential predictors of increased pain and poor coping (Calabrese et al., 2006; Prasertsri et al., 2011; Russo et al., 1997).

Personality has also been linked to coping and self-efficacy with chronic conditions including cancer. Franks, Chapman, Duberstein, and Jerant (2009) explored the moderating role of FFM of personality on the disease management self-efficacy of a home delivery variant of the Chronic Disease Self Management Program (Lorig et al., 1999). The researchers found personality factors moderated the self-efficacy enhancing effect of the intervention especially in those with high neuroticism and low conscientiousness (Franks et al., 2009). The moderating role of personality in the effectiveness of other health interventions deserves further study (Williams, O'Brien, & Colder, 2004).

Pain, Personality, and Self-Efficacy

Self-efficacy for managing pain, symptoms, and physical functioning may be critical to a patient's ability to manage the physical and psychological challenges of cancer (Porter, Keefe, Garst, McBride, & Baucom, 2008). Self-efficacy, an individual's perception regarding their own ability to execute certain actions to achieve desired outcomes, is an established mediator of health behaviors and outcomes across various patient populations and health conditions (Bandura, 1997; Franks et al., 2009; Litt, 1988). The FFM of personality has been found to underlie a range of characteristic adaptations involving social cognitive factors including self-evaluation, goal setting, and self-efficacy (Bandura, 1997). Data on the FFM and self-efficacy showed strong relations to neuroticism, extraversion and conscientiousness and small associations with

agreeableness and openness to experience (Judge, Erez, Bono, & Thoresen, 2002). Similar findings were reported by Williams et al. (2004) who found moderately strong negative correlations between health behavior self-efficacy and neuroticism and positive correlations with extraversion.

Although studies examining self-efficacy, personality, and chronic pain are limited, some relationships have been shown. Asghari and Nicholas (2006) explored personality, pain-related beliefs, self-efficacy, and coping in individuals with chronic pain over time. They found that out of the five personality dimensions studied, only neuroticism significantly predicted change in self-efficacy regarding pain, pain beliefs, and pain control. Those who scored higher on neuroticism had higher rates of catastrophizing, anxiety, and passive coping regarding chronic pain, a similar result found by previous studies (Ramirez-Maestre et al., 2004; Suls & Martin, 2005). These findings suggest that personality traits place some patients at risk for poor adjustment to chronic pain (Asghari & Nicholas, 2006).

FFM, Affect, and Pain

A number of studies have established that there are clear associations between the FFM of personality and positive and negative affect (Giluk, 2009; Hirsch, Floyd, & Duberstein, 2012; Watson & Clark, 1988). Costa and McCrae (1980) found that neuroticism predicted negative affect in everyday life, whereas extraversion predicted positive affect over a 10 year span.

Extensive research has examined the relationship between affect (both positive and negative) and chronic pain (Park & Sonty, 2010; Voogt et al., 2005; Zautra, Smith,

Affleck, & Tennen, 2001). In general, negative affect has been associated with greater levels of pain and functional impairment and poorer perceived health in cancer patients (Voogt et al., 2005). Hirsch and colleagues (2012) found that trait-based negative affect was significantly associated with poor physical and social functioning, poor reported general health, greater bodily pain, and greater role limitations due to emotional problems in patients with lung cancer. In addition, they found that positive affect was significantly predicted with less severe bodily pain, adaptive social functioning, and fewer role limitations. Based on these research results, clinicians and researchers should consider cancer patients' positive and negative affect in treating reported emotional problems and chronic pain.

The Influence of Race and Age on Personality and Self-efficacy

Few studies have addressed the need for diverse samples in the study of personality (Costa et al., 2001; Foldes, Duehr, & Ones, 2008; Goldberg et al., 1998; Lockenhoff et al., 2008). However, these studies had only made generalizations of the personality traits and differences between race groups (Costa, Terracciano, & McCrae, 2001). Foldes et al. (2008) investigated group differences in FFM of personality and found no difference between White, Black, Hispanic, and Asian younger workers. Utilizing similar workforce data, Goldberg and colleagues (1998) found small differences in personality between Whites, Blacks, and Hispanics with the largest correlation between conscientiousness and race with Blacks and Hispanics describing themselves as slightly less conscientious than Whites. A study by Lockenhoff et al. (2008) examined the influence of age, gender, race, and education on the FFM of personality stability and

change across an 8-year time span and found some racial differences in personality. Data showed that while Blacks had lower overall rank-order personality stability (consistency between race groups) than Whites in personality over time. However, Black participants showed greater consistency in mean-level stability (consistency within the individual) neuroticism and conscientiousness compared to Whites (Lockenhoff et al., 2008). These studies demonstrated more race similarities than differences in the FFM of personality among racially diverse adult samples.

Age has also been an influential factor in health psychology, personality, and self-efficacy research. Older adult samples are unique given that many are living with chronic diseases and disabilities, but still remain active members of society (Friedman, Kern, & Reynolds, 2010; Lockenhoff, Terracciano, Ferrucci, & Costa, 2012). The limited number of studies on the FFM of personality and health psychology of older adults have focused on mean-level and rank-order changes and stability of personality and its effect on health outcomes including mortality (Mroczek et al., 2007, 2009; Friedman et al., 2010; Mottus, Johnson, & Deary, 2012). These studies found a general trend toward more agreeableness, conscientiousness, and less neuroticism as the person ages (Goldberg et al., 1998; Mroczek et al., 2007, 2009; Friedman et al., 2010; Mottus et al., 2012).

There are also age-related changes in self-efficacy. Bandura (1994) found that as people age, they reappraise their self-efficacy. This reappraisal was attributed to declining physical and mental abilities and major life and role changes brought about by retirement, relocation, and loss of a spouse or friend. These physical, social, and psychological changes required a strong sense of self-efficacy for the maintenance of productive lives (Bandura, 1994).

Although there was some evidence of lower self-efficacy among young adult patients with chronic pain, the relationship between self-efficacy and age has not been entirely clear (Chong, Cogan, Randolph, & Racz, 2001). However, more studies of older adults found that higher self-efficacy for coping with cancer and cancer-related pain was associated with being older (Mosher, DuHamel, Egert, & Smith, 2010; Porter et al., 2008). The research on the personality and self-efficacy of older adults should integrate and recognize these influential age-related changes.

In addition to various personality types, affect, and self-efficacy, researchers also need to recognize the complexity of health status measurement in diverse older adults, which incorporates multiple physical and functional assessments, comorbidities, cognition, mental status, and cohort-specific health beliefs (Balducci, Colloca, Cesari, & Gambassi, 2010; Blank & Bellizzi, 2008). Further, researchers and clinicians should consider health behaviors unique to older adults. Seeking the input of health professionals serving older adults would help identify any distinctive health behaviors (e.g., adherence to medications) and stressors (e.g., limited insurance coverage) (Cheung & Lee, 2011; Jerram & Coleman, 1999). In addition, researchers utilizing older adult samples should be aware of the age-related changes in personality and self-efficacy (Mottus et al., 2012; Mroczek & Spiro, 2007; Small, Hertzog, Hultsch, & Dixon, 2003; Bandura, 1994). By including racially diverse older adults, researchers may test the robustness of these health and personality studies. Finally, the inclusion of older adults in health psychology research may further solidify the life span perspective as one of its main theories (Blank & Bellizzi, 2008).

CHAPTER THREE: METHODS

The following chapter describes the design of the project. The chapter begins with the project's goals and objectives followed by three research questions and hypotheses. The next section entitled, "methods" explains the parent project, recruitment, inclusion/exclusion criteria, interview process, and measures. Chapter Three closes with planned analyses organized by research question.

Goals and Objectives

The dissertation was a secondary study that explored the effect of the FFM of personality traits and positive and negative affect on reported pain severity and self-efficacy in pain management in older Black and White cancer patients. In addition, personality trends of White and Black older adults with cancer were identified. This dissertation research was unique for several reasons. First, previous research on personality has focused primarily on younger White participants with cancer (Augustine et al., 2008; Golden-Kreutz & Andersen, 2004; Urcuyo et al., 2005). Second, the project not only explored the relationship between personality and reported cancer pain severity, but also self-efficacy for chronic pain management.

Research Questions

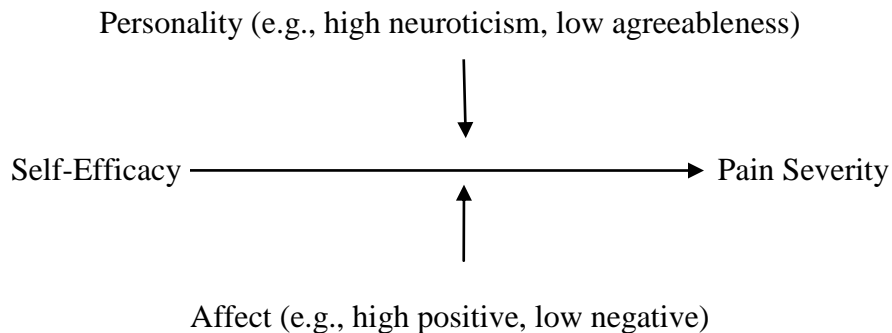
Research Question 1: Do different personality traits (high/low neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) and high/low positive and

negative affect influence reported pain severity (total, worst, least, average, and current pain) in a sample of older adults with cancer?

Hypothesis 1: Patients with low levels of neuroticism, high openness to experience, high conscientiousness, and positive affect report significantly lower pain severity.

Research Question 2: Does personality influence the relationship between self-efficacy for pain management and reported pain severity in older Whites and Blacks who have cancer-related pain?

Hypothesis 2: Personality and affect moderate the relationship between the patient's self-efficacy for pain management (PSE) and reported pain severity.



Research Question 3: Are there differences between older Whites and Blacks with cancer regarding the Five Factor Model of personality traits (e.g., high/low neuroticism, high/low openness to experience) and positive and negative affect?

Hypothesis 3: There are significant differences between older Whites and Blacks with cancer regarding the Five Factor Model of personality traits and positive and negative affect.

Methods

This study was a secondary study from Dr. Tamara Baker's five year project, Psycho-Sociocultural Factors influencing Cancer Pain Management in Elderly Adults (1 K01 CA131722-01A1), funded by the National Institutes of Health's National Cancer Institute. This investigation was approved by the Protocol Review Monitoring Committee at the H. Lee Moffitt Cancer Center and the University of South Florida's Institutional Review Board. The goal of the parent project is to examine identifiable social, cultural, and psychological constructs that influence the experience of cancer-related pain among elderly White and Black cancer patients. The project generates pilot data to determine the feasibility, acceptability, and appropriateness of an education based cancer pain management intervention program. The parent project is comprised of pre-intervention baseline data collection (Phase I), an education-based intervention, and a post-intervention follow up (Phase II). This dissertation utilized some of the pre-intervention data from the parent project.

The dissertation used only a subset of measures from Phase I from the parent project. The measures of personality and affect were chosen based on psychometric properties and validity in older diverse samples as well as their brevity. After receiving approval from Dr. Baker, personality measures, self-efficacy for pain management, and clinical variables (i.e., type of cancer, physical and mental functioning, pain interference) were added to the parent project's survey prior to data collection.

Participants

Participants included 150 White and Black patients receiving outpatient care, for any type of cancer, at the H. Lee Moffitt Cancer & Research Center (MCC) and Tampa General Hospital's Specialty Center at the 30th St. Healthpark (TGH). To be included for study participation, individuals must have been outpatients at one of the designated institutions; self-identify as either White or Black; be ≥ 55 years of age; had a pathologic diagnosis of cancer; experienced cancer-related pain for most days within the past 30 days and/or have a history of pain within the past 6 months; be able to provide informed consent; be able to read and understand English. Patients who enrolled in a cancer pain intervention or non-pharmacologic intervention within the past year, reported pain due to other chronic medical conditions (e.g., arthritis, diabetes), other than cancer-related pain, could not adequately read and understand English, were not eligible to participate in the study.

Recruitment and Interview Process

All participants were recruited from three treatment programs within the Moffitt Cancer Center (MCC): Psychosocial & Palliative Care, Clinical Research, and the Infusion Center. Participants were also recruited from Tampa General Hospital's Specialty Center at the 30th St. Healthpark.

The study's research assistants were responsible for patient recruitment and interviews. The research assistant approached potential participants during their medical visits (in the waiting area, while being triaged, and while receiving treatment) and determined if they were eligible for study participation. In the MCC's Clinical Trials unit,

the Psychosocial & Palliative Care units and TGH's oncology clinic, physicians and nurses helped identify potential participants by asking them about their pain during their clinical visit. If the patient reported pain, they were introduced to the research assistant who explained the study and received consent. In the MCC's Infusion Center, only the research assistant approached potential participants in the waiting area, determined if they fit the eligibility criteria, and received consent. Another method of recruitment was a project information display complete with an informative sign and pamphlets in the waiting area of the MCC Infusion Center. The sign and the pamphlets included the project's mission statement, description, and contact information for the research team. Those who were interested and met the eligibility criteria were asked to provide written consent. Two copies were signed by both the participant and research assistant, one copy was kept by the research assistant and the other was given to the participant for his/her records. After receiving consent, the research assistant administered the survey, which took approximately 45-60 minutes to complete. Upon completion, participants were given a \$10 gift card and gift bag containing a study pamphlet and small items (e.g., hand sanitizer, pen) as a token of appreciation for their participation.

If the participant was eligible and agreed to participate in the study, but was unable to complete the survey with the research assistant, then a telephone interview with a research assistant was scheduled and completed. A packet containing a response card (containing numbered responses for several survey measures), study pamphlet, and appointment reminder was given to the participant after giving informed consent at initial recruitment. The appointment reminder was a record of the time and date of the scheduled phone interview and the names of all potential research assistants who may

conduct the interview. If the phone interview was not completed after one phone call, subsequent calls were made to complete the questionnaire. Interview attempts via phone were managed on a case by case basis. All calls were recorded on a call log. Upon completing the phone interview, participants were mailed a thank you letter, \$10 gift card, and gift bag for their participation.

The mail-in surveys were given if the person or telephone interviews proved to be difficult or painful for the patient (e.g., patient has difficulty speaking and/or hearing). For mail-in surveys, individuals were recruited in person, consent forms were completed in person by both the research assistant and participant and a copy of the informed consent was given to the participant for their records. The participants were then given the survey with a return envelope to send in their completed survey at their convenience. Follow-up phone calls were conducted one week later to remind the participant to mail in their completed survey. All consent forms and completed surveys were kept in a locked filing cabinet.

Measures

Personality. The Ten Item Personality Inventory (TIPI) contains two items for each of the five dimensions of the FFM of personality. Items used a 7-point scale ranging from 1 = Disagree Strongly to 7 = Agree Strongly. Items are “extraverted, enthusiastic” and “reserved, quiet” (reversed) for Extraversion, “sympathetic, warm” and “critical, quarrelsome” (reversed) for Agreeableness, “dependable, self-disciplined” and “disorganized, careless” (reversed) for Conscientiousness, “calm, emotionally stable” and “anxious, “easily upset” (reversed) for Neuroticism, and “open to new experiences,

complex” and “conventional, uncreative” (reversed) for Openness to experience. Scores are averaged for each factor of the FFM and higher scores indicate stronger affirmation of the personality dimension (Gosling, Rentfrow, & Swann, 2003). *Reliability & Validity:* Coefficient alpha estimates of internal reliability was 0.72 for the five dimensions (ranging from .62 to .82) (Gosling et al., 2003; Ehrhart et al., 2009). Estimates of internal consistency in the present study returned low rates: extraversion (Cronbach’s $\alpha = .67$), agreeableness ($\alpha = .16$), conscientiousness ($\alpha = .63$), neuroticism ($\alpha = .43$), and openness ($\alpha = .36$), reflecting the low number of items making up the subscales. Correlations found measures of personality were significantly positively correlated with one another ($r = .19 - .43$) indicating convergent validity. The TIPI has been validated in older adult samples (Robinson, Demetre, & Corney, 2010), older cancer patient samples (Ramachandra, Booth, Pieters, Vrotsou, & Huppert, 2009), and racially diverse samples (Bernard, 2010; Gosling et al., 2003).

Affect. The Positive and Negative Affect Scale (PANAS) is a 20-item measure designed to assess self-reported mood states on two dimensions, positive and negative affect (Watson, Clark, & Tellegen, 1988). Each PANAS scale (positive and negative) comprises ten specific mood-related adjectives, rated on five-point scales, of frequency over a four-week period. Items are measured on a Likert-type scale (1= very slightly or not at all to 5= extremely) to indicate the extent to which the respondent has felt this way in the past month. Scores were summed for each subscale. A higher score for the positive affect subscale indicates a more positive affect and a higher score for the negative affect subscale indicates a more negative affect (Watson et al., 1988). *Reliability & Validity:*

Cronbach's alpha coefficients for various time reference periods range from 0.86 to 0.90 for the Positive Affect scale and 0.84 to 0.87 for the Negative Affect scale (Crawford & Henry, 2004; Watson et al., 1988). Reliability analysis of the current study found Cronbach's alpha for the Positive Affect and Negative Affect scales are 0.86 and 0.85, respectfully. Correlations found measures of positive and negative affect were significantly negatively correlated with one another ($r = -.35$) indicating convergent validity. The PANAS has been validated in older adult samples (Gellert, Ziegelmann, & Schwarzer, 2011; Ready et al., 2011), cancer patient samples (Hirsch et al., 2011; Voogt et al., 2005) and racially diverse samples (Brenes et al., 2008; Villodas, Villodas, & Roesch, 2011).

Pain Intensity. The Brief Pain Inventory (BPI) is a 32-item instrument designed to assess pain severity, interference, intervention, quality, impact of pain on daily functioning, location of pain, pain medications, and the amount of pain relief in the past 24 hours or the past week among patients with cancer pain (or pain due to other chronic medical illnesses). For the current study, the pain severity subscale and pain interference subscale were analyzed. The pain severity subscale includes current, average, worst, and least pain scores. A total pain score is a mean of the current, average, worst, and least pain scores. Response choices for each pain severity question are on an 11-point numeric summated rating scale (0 - 10; high scores denoting greater severity of the symptom) (Cleeland, 1989).

The BPI also measures how much pain has interfered with seven daily activities including general activity, walking, work, mood, sleep, enjoyment of life, and relations

with others. The pain interference subscale is the mean score of the seven interference items (Cleeland, 1989). Response choices for each pain interference question are on an 11-point numeric rating scale (0- 10), with 0 = no interference and 10 = interferes completely (Cleeland, 1989). *Reliability and Validity.* Internal consistency of the BPI has been demonstrated in a series of studies. Cronbach's alpha coefficients for the scale have ranged from 0.78 to 0.96 (Cleeland, 1989; Mendoza, Mayne, Rublee, & Cleeland, 2006). Reliability analysis of the current study found Cronbach's alpha for the BPI composite pain subscale is 0.84 and 0.90 for the pain interference subscale. Correlations found measures of pain severity and interference were significantly correlated with one another ($r = .42 - .82$) indicating convergent validity. The BPI has been validated across several cultures and translated into many different languages (Cleeland, 1989; Ferreira, Teixeira, Mendonza, & Cleeland, 2011). The BPI has also been used and endorsed in patients with chronic nonmalignant pain from other causes including AIDS and sickle cell disease (Cleeland, 1989; Miaskowski et al., 2011). Furthermore, it has been validated in racially diverse patient samples (Anderson et al., 2000; Mosher et al., 2010) and older adults with cancer (Garrison, Overcash, & McMillan, 2011; Miaskowski, 2010).

Self-Efficacy. The Chronic Pain Self-Efficacy Scale (CPSS) is a 22-item instrument designed to measure perceived self-efficacy to cope with chronic pain among pain patients. The measure consists of two subscales: self-efficacy for pain management (PSE) ("How certain are you that you can decrease your pain quite a bit?"), and self efficacy for coping with other symptoms (CSE) ("How certain are you that you can control your fatigue?"). Each question is scored on a 10 (very uncertain) to 100 (very

certain) scale (Anderson, Dowds, Pelletz, Edwards, & Peeters- Asdourian, 1995). Scores are averaged for each subscale, with higher scores indicating greater self-efficacy.

Reliability & Validity: Coefficient alpha estimates of internal reliability are 0.91 for the CSE and 0.86 for the PSE (Anderson et al., 1995). Reliability analysis of the current study found Cronbach's alpha for the PSE and CSE subscales are 0.69 and 0.87, respectively. Correlations found measures of PSE were significantly correlated within each measure ($r = .19 - .61$, respectively) indicating convergent validity. The CPSS has been validated in older adults with cancer-related pain (Porter et al., 2011) and racially diverse patient samples (Byrne et al., 2011; Jerant, Franks, Tancredi, Saito, & Kravitz, 2011).

Health. The Medical Outcomes Study 12-Item Short-Form Health Survey (SF-12) is composed of 12 questioning covering eight dimensions of health: Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role Emotional, and Mental Health (Ware, Kosinski, & Keller, 1996). Two SF-12 subscales, Physical Component Summary score (PCS) and Mental Component Summary score (MCS) were used to examine physical and mental health, respectively. The PCS includes Physical Functioning, Role Physical, Bodily Pain, and General Health. The MCS includes Vitality, Social Functioning, Role Emotional, and Mental Health. As part of the SF-12, the participants were asked questions that pertained to limitation of activities or problems with daily activities as a result of emotional or physical health problems. *Reliability & Validity:* The SF-12 has good test-retest reliability (coefficients for subscales ranged from 0.67 to 0.89) (Ware et al., 1996). In the current sample,

coefficient alpha estimates of internal reliability are 0.84 for the PCS and 0.81 for the MCS. Correlations found measures of PCS and MCS were significantly correlated within each measure ($r = .24 - .50$; $r = .31 - .63$, respectively) indicating convergent validity.

Sociodemographic and Clinical Characteristics. Age, race, gender, education, and marital status were assessed via self-reported data from all participants. Age (total number of years) was determined by the question, “What is your current age?”. Participants were also asked their date of birth (“What is your date of birth?”), responding in the following format: MMDDYY. Race was asked by the question, “Which of the following best describes your racial or ethnic background?” with the choices being 1) Hispanic or Latino, 2) White or Caucasian, 3) Black or African American, 4) Asian, 5) Other. Gender was assessed by the single item question, “What is your gender?” with choices being male/female. Education was assessed with one item asking participants to enter highest grade completed. Choices ranged from grade 1 to doctoral degree. Participants were instructed to respond to one of the following categories regarding their marital status: married, living as married, separated, divorced, single/never married, widowed. Type of cancer and number of chronic conditions were also collected via self-reported data from all participants.

Analyses

Data analyses ($N = 150$) were conducted in several steps. Descriptive analyses were conducted for the sociodemographic (age, race, sex, education, marital status), psychological (mental health, personality, and affect), clinical variables (type of cancer,

number of chronic conditions, physical health, pain interference), and pain-related variables (worst, least, average, current and total pain severity). A series of Pearson Product-moment correlation coefficients ($p \leq .05$) were calculated and used to determine the strength of the bivariate associations between the sociodemographic, psychological, health, and pain-related variables. Power analyses were conducted to ensure adequate statistical power using the software package, GPower 3.1.3 (Faul, Erdfelder, Lang, & Buchner, 2007). The PANAS and TIPI personality factors were dichotomized at the median score to facilitate interpretation of interactions in the regression and moderation models. Statistical significance for all analyses were determined with the probability of a Type I error, $p \leq .05$. All analyses were performed by using IBM SPSS Statistics 20.0.

Specific Analyses by Research Question

Research Question 1: Do different personality traits (high/low neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) and high/low positive and negative affect influence reported pain severity (total, worst, least, average, and current pain) in a sample of older adults with cancer?

Hypothesis 1: Patients with low levels of neuroticism, high openness to experience, high conscientiousness, and positive affect report significantly lower pain severity.

Analyses for Question 1: Hierarchical linear regressions were used to determine significant predictors of pain severity (high/low neuroticism, high/low extraversion, high/low agreeableness, high/low openness to experience, high/low conscientiousness, high/low positive, high/low negative affect) while controlling for sociodemographic information, psychological, and health variables.

Question 2: Does personality influence the relationship between self-efficacy for pain management and reported pain severity in older Whites and Blacks who have cancer-related pain?

Hypothesis 2: Personality and affect moderate the relationship between the patient's self-efficacy for pain management (PSE) and reported pain severity.

Analyses for Question 2: The moderation of self-efficacy for pain management and reported pain severity by high/low personality traits and affect was evaluated through moderated regression analyses as outlined in Aiken and West (1991). In this approach, the dependent variables (reported total, worst, least, average, and current pain severity) were regressed on the main effect predictor variable (self-efficacy for pain management), main effect moderator variable (high/low personality and affect), and their interaction (self-efficacy for pain management \times high/low personality/affect). A significant (t test) interaction (i.e., β regression coefficient) indicated moderation. The main effect and product terms were mean centered to facilitate interpretation and plotting of effects (Aiken & West, 1991). Once a significant moderator effect was determined, predicted values of the outcome variable for representative groups, such as those who are high and low moderator variables were computed (Aiken & West, 1991; Cohen, Cohen, West & Aiken, 2003; Frazier, Tix, & Barron, 2004). Computations were conducted using a SPSS macro script, MODPROBE (Hayes & Matthes, 2009), which utilized both the pick-a-point approach (Aiken & West, 1991; Cohen et al., 2003) and the Johnson-Neyman technique (Johnson & Fay, 1950) for probing interactions.

Question 3: Are there differences between older Whites and Blacks with cancer regarding the Five Factor Model of personality traits (e.g., high/low neuroticism, high/low openness to experience) and positive and negative affect?

Hypothesis 3: There are significant differences between older Whites and Blacks with cancer regarding the Five Factor Model of personality traits and positive and negative affect.

Analyses for Question 3: Mann-Whitney tests and *t* tests for independent samples were utilized to explore any differences in personality and affect variables between White and Black participants. An additional *t* test was conducted to determine any significant race differences in positive affect. Power analyses for *t*-tests utilized harmonic means ($N_H = 60.68$) because of different sample sizes for the White and Black participants. *T*-test effect size calculations used pooled standard deviation accounting for the different sample sizes of the White and Black participants.

CHAPTER FOUR: RESULTS

The following chapter describes the results of statistical analyses of the study. The chapter begins with descriptive results regarding sociodemographic, psychological, and health characteristics. The next section explains the pain, personality, and self-efficacy characteristics of the sample. Chapter Four continues with bivariate correlations, hierarchical linear regressions, and moderation analyses. Thirteen tables and two figures display the results.

Results

Descriptive Demographic and Health Characteristics

Table 4.1 describes the demographic, health, and pain characteristics of the sample. The sample consisted of 150 adult patients, with a mean age of 65.38 ± 7.72 years. More than half of the sample was female and married. The majority of the participants identified themselves as non-Hispanic White and had at least a 12th grade education.

Breast (18%), hematologic (13%), and lung (15%) cancers were the most common diagnoses. Participants reported living with an average of three chronic medical conditions in addition to cancer. Approximately a third of the sample rated their health as “fair” (Table 4.1).

Pain Characteristics

Seventy-two percent of the sample reported their pain was cancer-related, 64% reported their pain was due to the effects of treatment, and another 43% attributed their pain to non-cancer related conditions (e.g., osteoarthritis, fibromyalgia). Fifty-seven percent of the patients had worst pain scores that were “severe” in intensity (7 or more on a 0-10 scale). Patients also described considerable interference due to pain in their daily activities (Table 4.1).

Table 4.1

Demographic, Health, and Pain Characteristics (N = 150)

Variable	<i>M ± SD</i>	<i>Range</i>	<i>%</i>
Age	65.38 ± 7.72	55-90	
Race (% White)			82%
Sex (% Female)			57%
Marital Status (% Married)			59%
≥ High School Education			93%
Number of Chronic Conditions	2.68 ± 2.21		
<i>Health Characteristics</i>			
Diagnosis Date (≥ 55 months)			28%
Self-Reported Health as “Fair”			30%
Physical Health (PCS)	30.49 ± 9.60		
Mental Health (MCS)	47.56 ± 11.58		
Self-efficacy for Pain Management	55.71 ± 18.83	10-100	
<i>Pain Characteristics</i> [†]			
Worst Pain	6.53 ± 2.57		
Least Pain	2.45 ± 2.15		
Average Pain	4.15 ± 2.01		
Current Pain	2.89 ± 2.53		
Pain Interference	4.80 ± 2.46		

[†]Brief Pain Inventory Scale: 0-10, 10 = worst.

Personality and Affect

The participants reported similar scores across measures of extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience. Openness to experience was the highest rated on a 1-7 scale with a score of 4.57 ± 1.18 . Extraversion was the second highest rated personality trait followed by neuroticism, agreeableness, and conscientiousness. The sample had a mean positive affect of 35.29 ± 7.91 and mean negative affect of 17.65 ± 6.67 (Table 4.2).

Table 4.2

Affect and Personality Characteristics (N = 150)

Variable	<i>M</i> ± <i>SD</i>	<i>Range</i>
Positive Affect [†]	35.29 ± 7.91	16-50
Negative Affect	17.65 ± 6.67	10-36
<i>Personality</i> [‡]		
Extraversion	4.55 ± 1.24	
Neuroticism	4.38 ± 1.00	
Agreeableness	4.32 ± 1.01	
Conscientiousness	4.26 ± 0.88	
Openness to Experience	4.57 ± 1.18	

[†]Positive and Negative Affect Scale: 10-50, 50 = highest; [‡]Ten Item Personality Scale: 1 = Disagree Strongly to 7 = Agree Strongly.

Personality by Race

White and Black participants reported comparable TIPI mean scores measuring the FFM of personality ($d = .21$). High scores on the TIPI indicate agree strongly, low

scores indicate disagree strongly (scale: 1-7). For Whites, openness to experience was the highest rated with a mean score of 4.56 ± 1.18 . Extraversion was the second highest reported personality trait followed by neuroticism, conscientiousness, and agreeableness. For Blacks, extraversion was the highest rated with a score of 4.88 ± 1.31 . Openness to experience was the second highest reported personality trait followed by agreeableness, neuroticism, and conscientiousness. There were no significant race group differences of personality traits (Table 4.3).

Affect and Self-efficacy by Race

Black patients reported significantly higher positive affect compared to White patients ($p = .02$, $d = .48$). No significant race differences were found in reported negative affect between White and Black patients ($p = .92$, $d = .02$). There were no significant differences in self-efficacy for pain management between White and Black patients ($p = .35$, $d = .18$) (Table 4.3).

Table 4.3

Self-efficacy for Pain Management, Affect, and Personality by Race (N = 150)

Variable	Whites (n = 123)	Blacks (n = 27)	<i>p</i>
	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	
Positive Affect [†]	34.58 ± 7.43	38.62 ± 9.28	.02
Negative Affect	17.63 ± 6.68	17.77 ± 6.76	.92
Self-efficacy for Pain Management [‡]	54.99 ± 18.84	58.74 ± 21.61	.35
<i>Personality</i> [‡]			
Extraversion	4.48 ± 1.21	4.88 ± 1.31	.13
Neuroticism	4.42 ± 1.01	4.17 ± 0.89	.24
Agreeableness	4.29 ± 0.99	4.44 ± 1.14	.47
Conscientiousness	4.31 ± 0.89	4.04 ± 0.84	.15
Openness to Experience	4.56 ± 1.18	4.59 ± 1.21	.91

[†]Positive and Negative Affect Scale: 10 - 50, 50 = highest; [‡]Self-efficacy for Pain Management Scale: 10=very uncertain to 100=very certain; [‡]Personality Scale: 1 = Disagree Strongly to 7 = Agree Strongly.

Positive Affect by Race

An additional *t* test was conducted to determine possible significant race differences in specific items of positive affect. Black patients reported significantly higher presence of being more excited, alert, inspired, determined and attentive than Whites (Table 4.4).

Table 4.4

Positive Affect Items by Race (N = 150)

Variable	Whites (n = 123)	Blacks (n = 27)	<i>p</i>
	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>	
Interested [†]	2.94 ± 1.03	3.12 ± 1.18	.45
Excited	1.52 ± 1.21	2.19 ± 1.63	.02
Strong	2.67 ± 1.17	2.88 ± 1.31	.40
Enthusiastic	2.28 ± 1.22	2.58 ± 1.45	.27
Proud	2.49 ± 1.36	2.92 ± 1.55	.15
Alert	2.80 ± 1.01	3.31 ± 1.01	.02
Inspired	1.96 ± 1.17	2.85 ± 1.52	<.001
Determined	2.96 ± 1.00	3.19 ± 1.10	.01
Attentive	2.74 ± 0.95	3.19 ± 1.02	.03
Active	2.25 ± 1.27	2.08 ± 1.44	.54

[†] Positive Affect Scale: 0 = very little or not at all to 4 = extremely.

Bivariate Correlation Results

Several correlations were found between personality and affect, self-efficacy for pain management, pain severity (total, worst, least, current, and average), sociodemographic and clinical variables. Table 4.5 shows correlations between pain, personality, affect, self-efficacy for pain management, and pain interference.

Bivariate Correlations for Pain

Greater total pain was found to be associated with lower self-efficacy for pain management ($r = -.23, p < .01$), more chronic conditions ($r = .38, p < .001$), greater pain interference ($r = .56, p < .001$) and higher negative affect ($r = .19, p < .05$). Greater worst pain was associated with greater pain interference ($r = -.18, p < .05$), lower mental health scores ($r = -.22, p < .01$), and higher negative affect ($r = .23, p < .01$). Worst pain was also positively correlated with more chronic conditions ($r = .26, p < .01$) and greater pain interference ($r = .55, p < .001$). Significant correlations were found between higher levels of least pain and lower self-efficacy for pain management ($r = -.20, p < .05$) and greater pain interference ($r = .33, p < .001$)

Average pain was associated with more chronic conditions ($r = .27, p < .001$), and greater pain interference ($r = 0.51, p < .001$). Higher levels of current pain was associated with lower levels of extraversion ($r = -.28, p < .001$), lower positive affect ($r = -.17, p < .05$) and higher negative affect ($r = .20, p < .05$). Lower self-efficacy for pain management ($r = -.26, p < .05$), lower positive affect ($r = -.17, p < .05$), more chronic conditions ($r = .36, p < .001$), and greater pain interference ($r = .44, p < .001$) were also associated with reported current pain (Table 4.5).

Bivariate Correlations for Self-efficacy for Pain Management

Self-efficacy for pain management was also associated with higher mental health scores ($r = .45, p < .001$), fewer chronic conditions ($r = -.20, p < .05$), and lower pain interference ($r = -.37, p < .001$). Self-efficacy for pain management was also associated

with higher positive affect ($r = .33, p < .001$), and lower negative affect ($r = -.35, p < .001$) (Table 4.5).

Bivariate Correlations for Personality

Dichotomized extraversion was also associated with higher mental health scores ($r = .23, p < .01$) and higher positive affect ($r = .17, p < .05$). Dichotomized neuroticism was associated with being female ($r = .18, p < .05$), lower mental health scores ($r = -.28, p < .001$), lower positive affect ($r = -.17, p < .05$), and higher negative affect ($r = .29, p < .001$).

Dichotomized conscientiousness was associated with lower positive affect ($r = -.23, p < .01$) while dichotomized openness to experience was associated with fewer chronic conditions ($r = -.24, p < .01$) and lower pain interference ($r = -.19, p < .05$). Dichotomized agreeableness was not significantly associated with self-efficacy for pain management, pain severity (total, worst, least, current, and average), sociodemographic, psychological, or health variables (Table 4.5).

Bivariate Correlations for Affect

Dichotomized positive affect was also associated with higher mental health scores ($r = .36, p < .001$) and lower pain interference ($r = -.21, p < .05$). Positive affect was also positively associated with being Black ($r = .20, p < .05$). Dichotomized negative affect was associated with lower mental health scores ($r = -.49, p < .001$), more chronic conditions ($r = .19, p < .05$) and greater pain interference ($r = .34, p < .001$) (Table 4.5).

Table 4.5

Correlation Table for Pain Severity, Personality, Affect, and Self-efficacy for Pain Management (N=150)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Total Pain	--													
2. Worst Pain	.80*	--												
3. Least Pain	.82***	.47***	--											
4. Average Pain	.89***	.69***	.71***	--										
5. Current Pain	.80***	.46***	.59***	.58***	--									
6. High/Low E	-.15	-.04	-.04	-.12	-.28***	--								
7. High/Low N	-.05	.02	-.04	-.12	.004	.08	--							
8. High/Low A	-.05	.01	-.02	-.06	-.02	.19*	.01	--						
9. High/Low C	-.03	-.09	-.03	-.10	.001	.07	.06	.04	--					
10. High/Low O	-.06	-.04	-.02	.02	-.09	.11	-.06	.01	.17	--				
11. High/Low PA	-.09	-.06	-.01	.004	-.17*	.17*	.19	-.07	-.23**	.16	--			
12. High/Low NA	.19*	.23**	.10	.11	.20*	-.13	.29***	.16	.11	-.04	-.35***	--		
13. PSE	-.23**	-.14	-.20*	-.16	-.26**	.16	-.17	.05	-.16	-.03	.33***	-.35***	--	
14. Pain Interference	.56***	.55***	.33***	.51***	.44***	-.11	.08	.003	.04	-.19*	-.21	.34***	-.37***	--

* = $p < .05$, ** = $p < .01$, *** = $p < .001$. N = Neuroticism, E = Extraversion, C = Conscientiousness, A = Agreeableness, O = Openness to Experience, PA = Positive Affect, NA = Negative Affect, PSE = Self-efficacy for Pain Management.

Regressions

Significant predictors of the presence of pain severity (total, worst, least, average, and current) were calculated after controlling for important covariates (age, sex, race, education, marital status, number of chronic conditions, mental health, clinical variables, pain interference, type of cancer, high/low FFM of personality, and high/low positive and negative affect) entered in the final model. Due to high correlations with each other, some demographic variables (i.e., age, gender, marital status) and health variables (i.e., physical functioning and type of cancer) were omitted. The post hoc analyses revealed the statistical power for this study was .87 for detecting a small effect, whereas the power exceeded .99 for the detection of a moderate to large effect size. Thus, there was more than adequate power (i.e., power \geq .80) at all effect size levels.

Regression Results for Total Pain

Significant predictors of the presence of total pain were calculated after controlling for covariates (education, number of chronic conditions, pain interference, high/low FFM of personality, and high/low positive and negative affect) entered in the final model. Due to multicollinearity, age, race, gender, marital status, mental health, physical health, and type of cancer were omitted from this analysis. In Step 1, education was added. The number of chronic conditions and pain interference were added in Step 2. In Step 3, personality variables were added and in Step 4, negative and positive affect were added to the model.

As shown in Table 4.6, lower education ($\beta = -.19$, 95% CI = $-.28$ to $-.04$; $p < .01$), more chronic conditions ($\beta = .21$, 95% CI = $.05$ to $.31$; $p < .01$), greater pain interference

($\beta = .52$, 95% CI = .29 to .53; $p < .001$) were significant predictors of higher total pain.

Personality traits and affect were not significant predictors of higher total pain.

Table 4.6

Hierarchical Regression Analysis for Variables Predicting Total Pain Severity (N = 150)

Predictor	ΔR^2	β
Step 1	.04*	
Education		-0.20*
Step 2	.32***	
Education		-0.17*
Chronic Conditions		0.18*
Pain Interference		0.50***
Step 3	.04	
Education		-0.19*
Chronic Conditions		0.22**
Pain Interference		0.52***
Step 4	.004	
Education		-0.19**
Chronic Conditions		0.21**
Pain Interference		0.52***
Total R^2	.36	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Regression Results for Worst Pain

After controlling for covariates (education, number of chronic conditions, pain interference, high/low FFM of personality, and high/low positive and negative affect), significant predictors of worst pain were lower education ($\beta = -.17$, 95% CI = $-.36$ to $-.03$; $p < .05$), and greater pain interference ($\beta = .55$, 95% CI = $.40$ to $.73$; $p < .001$) (Table 3.7). Personality and positive and negative affect were not significant predictors of worst pain severity. Due to multicollinearity, age, race, gender, marital status, mental health, physical health, and type of cancer were omitted from this analysis. In Step 1, education was added. The number of chronic conditions and pain interference were added in Step 2. In Step 3, personality variables were added and in Step 4, negative and positive affect were added to the model.

Regression Results for Least Pain

Significant predictors of least pain were calculated after controlling for education, number of chronic conditions, pain interference, high/low FFM of personality, and high/low positive and negative affect. Due to multicollinearity, age, race, gender, marital status, mental health, physical health, and type of cancer were omitted from this analysis.

In Step 1, education was added. The number of chronic conditions and pain interference were added in Step 2. In Step 3, personality variables were added and in Step 4, negative and positive affect were added to the model.

As shown in Table 4.8, lower education ($\beta = -.21$, 95% CI = $-.35$ to $-.03$; $p < .05$), more chronic conditions ($\beta = .20$, 95% CI = $.02$ to $.36$; $p < .05$), and greater pain interference ($\beta = .30$, 95% CI = $.11$ to $.42$; $p < .001$) were significant predictors of least

pain. Personality and positive and negative affect were not significant predictors of least pain severity.

Table 4.7

Hierarchical Regression Analysis for Variables Predicting Worst Pain Severity (N = 150)

Predictor	ΔR^2	β
Step 1	.03*	
Education		-0.18*
Step 2	.32***	
Education		-0.16*
Pain Interference		0.54***
Step 3	.02	
Education		-0.16*
Pain Interference		0.54***
Step 4	.01	
Education		-0.17*
Pain Interference		0.53***
Total R^2	.33	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4.8

*Hierarchical Regression Analysis for Variables Predicting Least Pain Severity
(N = 150)*

Predictor	ΔR^2	β
Step 1	.04**	
Education		-0.22**
Step 2	.12***	
Education		-0.19*
Pain Interference		0.27**
Step 3	.02	
Education		-0.20*
Chronic Conditions		0.20*
Pain Interference		0.29***
Step 4	.01	
Education		-0.21*
Chronic Conditions		0.20*
Pain Interference		0.30***
Total R^2	.13	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Regression Results for Average Pain

Significant predictors of average pain were calculated after controlling for covariates (education, number of chronic conditions, pain interference, high/low FFM of personality, and high/low positive and negative affect). Due to multicollinearity, age, race, gender, marital status, mental health, physical health, and type of cancer were

omitted from this analysis. In Step 1, education was added. The number of chronic conditions and pain interference were added in Step 2. In Step 3, personality variables were added and in Step 4, negative and positive affect were added to the model. The final model showed that significant predictors of average pain were lower education ($\beta = -.23$, 95% CI = $-.34$ to $-.08$; $p < .01$), more chronic conditions ($\beta = .18$, 95% CI = $.02$ to $.30$; $p < .05$), greater pain interference ($\beta = .51$, 95% CI = $.30$ to $.56$; $p < .001$), and higher openness to experience ($\beta = .18$, 95% CI = $.11$ to 1.38 ; $p < .01$) (Table 4.9). The remaining personality traits and positive and negative affect were not significant predictors of current pain severity.

Regression Results for Current Pain

Significant predictors of current pain were calculated after controlling for race, education, number of chronic conditions, pain interference, high/low FFM of personality, and high/low positive and negative affect. Due to multicollinearity, age, gender, marital status, mental health, physical health, and type of cancer were omitted from this analysis. In Step 1, race and education were added. The number of chronic conditions and pain interference were added in Step 2. In Step 3, personality variables were added and in Step 4, negative and positive affect were added to the model. Table 4.10 shows that being White ($\beta = -.19$, 95% CI: -2.35 to $-.22$; $p < .05$), more chronic conditions ($\beta = .21$, 95% CI = $.04$ to $.42$; $p < .05$), greater pain interference ($\beta = .38$, 95% CI = $.23$ to $.58$; $p < .001$), and lower extraversion ($\beta = -.21$, 95% CI = -1.88 to $-.27$; $p < .01$) were significant predictors of current pain. The remaining personality traits and positive and negative affect were not significant predictors of current pain severity.

Table 4.9

Hierarchical Regression Analysis for Variables Predicting Average Pain Severity (N = 150)

Predictor	ΔR^2	β
Step 1	.05*	
Education		-0.22*
Step 2	.24***	
Education		-0.20*
Pain Interference		0.46***
Step 3	.09**	
Education		-0.22**
Chronic Conditions		0.18*
Pain Interference		0.49***
High/Low N		-0.15*
High/Low C		-0.17*
High/Low O		0.20**
Step 4	.01	
Education		-0.23**
Chronic Conditions		0.18*
Pain Interference		0.51***
High/Low O		0.18*
Total R^2	.34	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4.10

Hierarchical Regression Analysis for Variables Predicting Current Pain Severity (N = 150)

Predictor	ΔR^2	β
Step 1	.02	
Step 2	.25***	
Race		-0.21**
Chronic Conditions		0.20**
Pain Interference		0.38***
Step 3	.05	
Race		-0.19*
Chronic Conditions		0.21*
Pain Interference		0.39***
High/Low E		-0.21**
Step 4	.002	
Race		-0.19*
Chronic Conditions		0.21*
Pain Interference		0.38***
High/Low E		-0.21**
Total R^2	.26	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Regression Results for Self-efficacy for Pain Management

Self-efficacy for pain management was similarly calculated after controlling for previously mentioned covariates (education, number of chronic conditions, pain

interference, mental health, high/low FFM of personality, and high/low positive and negative affect). The final model showed that higher mental health ($\beta = .26$, 95% CI = .11 to .72; $p < .05$), and higher agreeableness ($\beta = .18$, 95% CI = .67 to 12.67, $p < .05$) were significant predictors of self-efficacy for pain management (Table 4.11). None of the remaining demographic, physical, or personality characteristics were statistically significant predictors of self-efficacy for pain management.

Table 4.11

Hierarchical Regression Analysis for Variables Predicting Self-efficacy for Pain Management (N = 150)

Predictor	ΔR^2	β
Step 1	.001	
Step 2	.23***	
Pain Interference		-0.18*
Mental Health		0.33***
Step 3	.05	
Pain Interference		-0.18*
Mental Health		0.32***
High/Low A		0.17*
Step 4	.02	
Mental Health		0.26**
High/Low A		0.18*
Total R^2	.19	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Moderation Results

Hierarchical regressions were performed to determine if the relationship between self-efficacy for pain management and reported pain severity was moderated by dichotomized neuroticism, extraversion, conscientiousness, agreeableness, and openness to experience) and positive and negative affect. Two interactions, worst pain \times dichotomized extraversion and worst pain \times dichotomized conscientiousness, were found to be significant ($p < .05$; see Table 4.12). Regression equations were then solved for combinations of worst pain and dichotomized extraversion values.

Additional analyses measuring the conditional effect of self-efficacy for pain management at the high and low values of extraversion found that the relationship between self-efficacy for pain management and low extraversion was significantly different than self-efficacy for pain management and high extraversion ($p < .05$). Significant differences were also found between high and low conscientiousness and their relationship with self-efficacy for pain management ($p < .01$). Scores of self-efficacy for pain management did not interact significantly with dichotomized personality variables, neuroticism ($p = .44$), openness to experience ($p = .18$), and agreeableness ($p = .06$), to predict worst pain severity. Scores for self-efficacy for pain management did not interact significantly with the dichotomized measures of personality to predict reported total pain, least pain, average pain, and current pain (see Table 4.12). Lastly, scores for self-efficacy for pain management did not interact significantly with the dichotomized measures of positive and negative affect to predict reported total pain, least pain, average pain, and current pain (See Table 4.13).

Table 4.12 Moderator effects (*Self-efficacy for Pain Management* × *Personality/Affect Interactions*) for high/low personality

Variable	High/low Neuroticism			High/low Extraversion			High/low Openness to Experience			High/low Agreeableness			High/low Conscientiousness		
	β	t	p	β	t	p	β	t	p	β	t	p	β	t	p
PSE x Total Pain	-.02	-1.01	.31	.03	1.63	.11	-.003	-.15	.88	-.02	-1.16	.25	-.03	-1.60	.11
PSE x Worst Pain	-.02	-.77	.44	.05	2.13	.04	-.03	-1.36	.18	-.05	-1.95	.06	-.05	-2.15	.04
PSE x Least Pain	-.02	-1.21	.23	.03	1.32	.19	.01	.45	.65	-.02	-1.17	.24	-.02	-1.15	.25
PSE x Average Pain	-.02	-.83	.41	.02	1.26	.21	.01	.54	.59	-.02	-.82	.41	-.02	-.87	.38
PSE x Current Pain	-.01	-.53	.60	.01	.50	.62	.003	.14	.89	.004	.17	.86	-.02	-.86	.39

PSE = Self-efficacy for Pain Management Scale; Personality: High ≥ 4 , Low ≤ 3 on TIPI scale (1=disagree strongly to 7=agree strongly). β = standardized beta coefficient for the interaction effect in the moderated regression equation. $T = t$ test for the interaction term, $p = p < .05$.

Table 4.13

Positive and Negative Affect Moderator Effects for Self-efficacy for Pain Management and Pain Severity

Variable	Positive Affect			Negative Affect		
	β	t	p	β	t	p
PSE \times Total Pain	-.02	-1.16	.25	.002	.13	.89
PSE \times Worst Pain	-.005	-.21	.84	.005	.19	.85
PSE \times Least Pain	-.03	-1.50	.14	.01	.64	.52
PSE \times Average Pain	-.03	-1.39	.17	.01	.35	.73
PSE \times Current Pain	-.02	-.91	.36	-.01	-.61	.54

PSE = Self-efficacy for Pain Management Scale; β = standardized beta coefficient for the interaction effect in the moderated regression equation. $t = t$ test for the interaction term, $p = p < .05$.

Predicted pain severity values for these hypothetical scores are shown in Figure 4.1. Results suggest that the positive association between self-efficacy for pain management and worst pain applies most strongly to patients with high extraversion, such that patients with high PSE and high extraversion tended to report the highest worst pain of all patients.

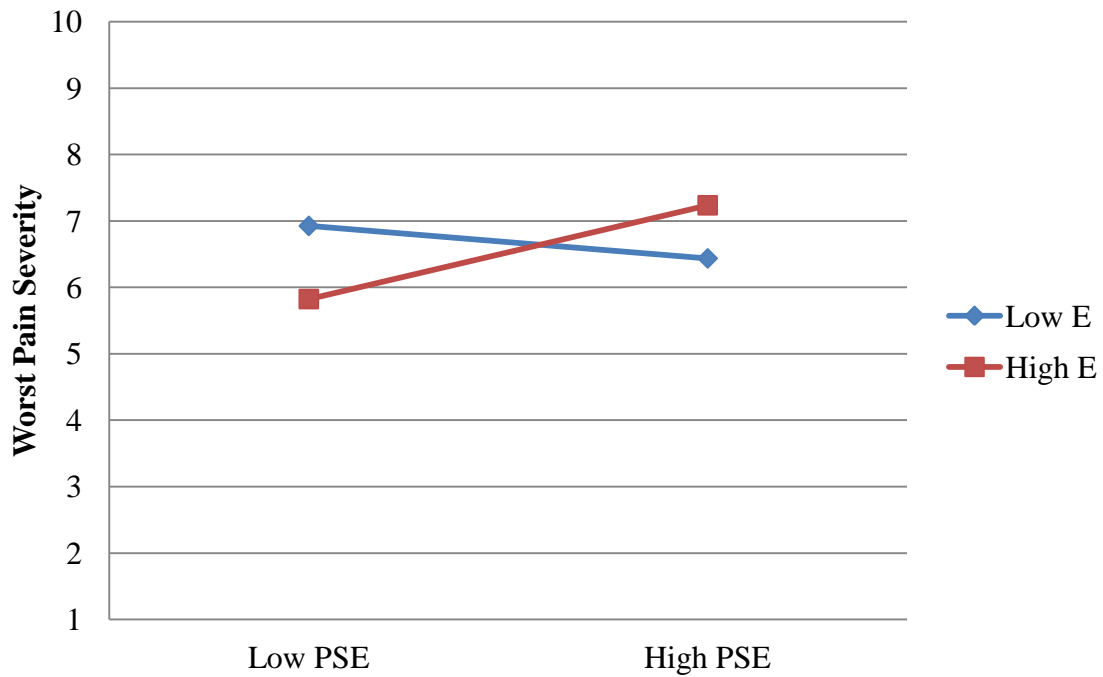


Figure 4.1 Extraversion as a Moderator of the PSE to Worst Pain Severity Relationship. PSE = Self-efficacy for Pain Management; E = Extraversion. Low & High PSE Scores = centered on the mean scores for PSE.

Figure 4.2 presents the regression slopes for the conscientiousness by self-efficacy for pain management interaction. Results suggest that the positive association between self-efficacy for pain management and worst pain applies most strongly to patients with low conscientiousness, such that patients with low PSE and low extraversion tended to report the highest worst pain of all patients. Results from both

figures imply that the highest reported worst pain severity was reported by patients who were characterized by high extraversion and low conscientiousness.

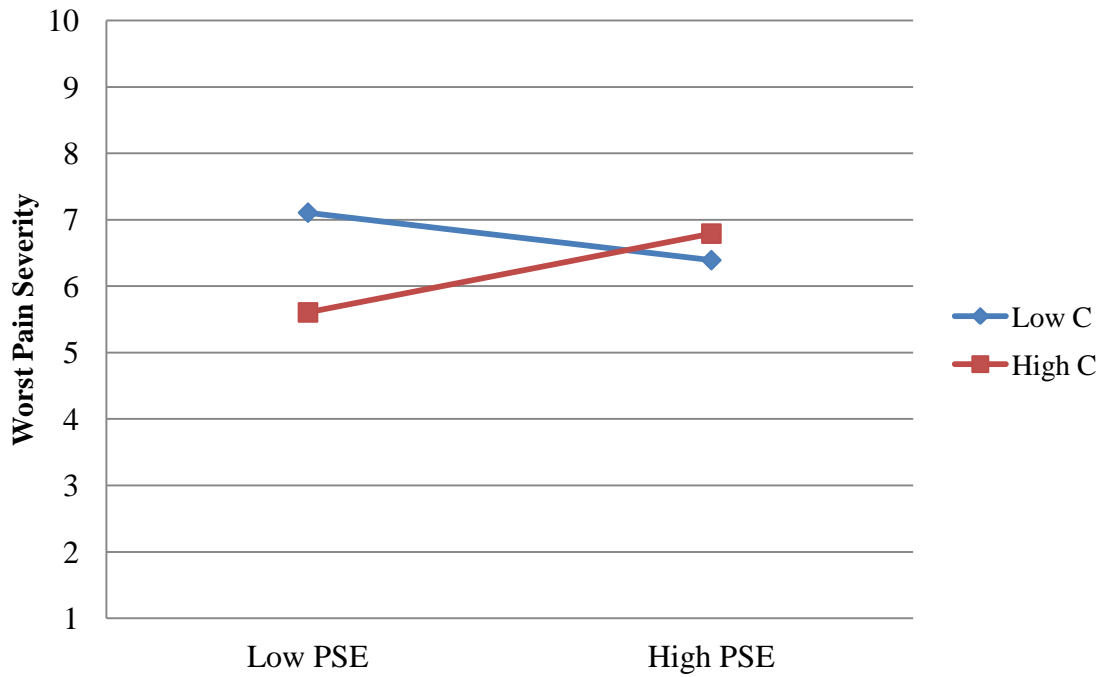


Figure 4.2 Conscientiousness as a Moderator of the PSE to Worst Pain Severity Relationship. PSE = Self-efficacy for Pain Management; C = Conscientiousness. Low & High PSE Scores = centered on the mean scores for PSE

CHAPTER FIVE: DISCUSSION

The following chapter discusses the results of statistical analyses of the study. The chapter begins with discussion regarding the findings from Research Questions 1 and 2, which investigated the relationship between patient personality, pain severity, and self-efficacy for pain management. The next section discusses the results from Research Question 3, which explored possible race differences in personality and affect. Chapter Five continues with study limitations, future directions, and ends with the conclusion.

Discussion

The study explored the effect of the Five Factor Model of personality traits (neuroticism, extraversion, conscientiousness, agreeableness, and openness to experience) and positive and negative affect on reported pain severity (total, worst, least, average, and current pain) and self-efficacy for pain management in older Black and White cancer patients. The dissertation was divided into three research questions. The first question investigated the influence of personality and affect on reported pain and self-efficacy for pain management. The second question explored the possible moderation effects of personality on the relationship between self-efficacy for pain management and reported pain severity. The last research question investigated possible race differences in reported personality and affect.

As hypothesized, personality was a significant predictor of pain severity, however, only two personality traits, low extraversion and high openness to experience, were significant predictors of current pain and average pain, respectively. One personality trait, high agreeableness, was a significant predictor of self-efficacy for pain management. Two moderation effects from extraversion and conscientiousness were found between self-efficacy for pain management and worst pain severity. The moderation analysis found that the highest reported worst pain severity occurred in patients who had high extraversion and low conscientiousness. The remaining personality variables, neuroticism and positive and negative affect, were not significant predictors or moderators of reported pain severity (total, worst, least, average, and current pain) and self-efficacy for pain management.

Extraversion

The result that low extraversion (quietness, less involved socially) predicts higher current pain is consistent with the current literature. This finding is supported by prior research suggesting that extraversion is negatively related to the perceived intensity of chronic pain (Phillips & Gatchel, 2000; Ramirez-Maestre et al., 2004). Because individuals with low extraversion tend to limit social involvement and internalize their thoughts and feelings, they presumably would behave similarly in a medical environment. The tendency to be socially reserved suggests personality may be a possible barrier to patient-physician communication regarding cancer treatment and pain management. For example, an introverted person (low extraversion) may not be as forthcoming about their symptoms and, as a result, these symptoms are untreated.

Extraversion is related to satisfaction and stability in close relationships including the physician-patient relationship. Individuals with low extraversion may limit their reporting of symptoms to their physician. This tendency to be introverted and unsociable may not elicit the same personable response from a physician, which may inhibit the ease of discussing symptoms. If the patient-physician communication is limited, efficacy of the treatment may be compromised. Previous studies have found that patients in pain without social tendencies (sociable, outgoing attitudes and actions) received no analgesics to resolve their unreported pain (Bond, 1971; Stiefel, 1993). Individuals with high extraversion (being warm, gregarious, and outgoing) may elicit a more caring and empathetic response from their physicians because the physicians may feel that they are building effective rapport (Noyes, Kukoyi, Longley, Langbehn, & Stuart, 2011). In turn, patient-physician communication may be more effective in addressing symptoms.

Conversely, moderation analyses found that the highest worst pain severity was observed in high extraverted patients with high PSE. This finding is also supported in previous research, which have found extraverts report more chronic pain and are more willing to ask for analgesics compared to introverts (Phillips & Gatchel, 2000; Wade, Dougherty, Hart, Rafii, & Price, 1992). This result suggests that being extraverted may be advantageous in order to have pain recognized as a problematic symptom and to receive analgesics.

Higher extraversion may be considered a health-promoting trait by facilitating certain positive pain behaviors such as symptom reporting and seeking out social support for distressing symptoms. Furthermore, experiencing severe worst pain may encourage extraverted behavior in patients who need pain relief. Individuals with low extraversion

may be more outspoken about their symptoms if an analgesic regimen is absent or ineffective. On the other hand, high extraversion may be related to over reporting of symptoms resulting in higher reported worst pain severity. These individuals with high extraversion may feel comfortable communicating their symptoms and overemphasize their symptoms.

The conflicting findings of high and low extraversion as predictors of pain severity demonstrate the importance of utilizing all BPI pain measures to determine reported pain severity. In addition, these findings encourage the measurement of extraversion as it may influence self-efficacy and reported pain severity. These results also suggest that patient willingness to report pain may vary given the severity of the pain.

Although age was not a significant predictor of pain severity and self-efficacy for chronic pain management, age and/or cohort effects may be a factor related to extraversion and symptom reporting in the sample (Jacobsen et al., 2009). For older generations, an expected patient role is to “be a good patient”, to not ask questions, and adhere to the physician’s treatment plan and analgesic regimens. The older patient may not want to report unresolved symptoms or to question treatments recommended by the physician (Jacobsen et al., 2009). As a result, burdensome symptoms such as pain are not reported and left untreated.

Another possible age effect is the difficulty discerning what is a cancer-related symptom and what is assumed to be an age-related condition. Older individuals, in particular those with low extraversion, may not be as communicative regarding their pain because they assume chronic pain is an expected part of aging, which may lead to

untreated pain and subsequent physical and psychological distress. Clinicians and researchers need to be aware of the influence of age and personality in symptom reporting to comprehensively address their pain and provide an effective treatment regimen.

In addition to communicating with health care professionals, extraverts are more likely to call on positive social support, a significant resource for pain management (Polomano, Droog, Purinton, & Cohen, 2007). Previous studies have found that high extraversion (prosocial functioning) predicted the use of active and effective strategies such as expressing feelings and seeking social support for handling pain (Phillips and Gatchel, 2000; Ramirez-Maestre et al., 2004). Knowledge of the influence of extraversion on chronic pain and differences in coping styles may provide the basis for new approaches to supportive care, as current and worst pain severity can be effectively treated in both high and low extraverted patients (Gatchel, 2000).

Openness to Experience

High openness to experience, which reflects high attentiveness in one's personal experiences, was a predictor of average pain severity. These individuals have great internal focus, intellectual curiosity, and are concerned about their personal experiences and freedoms. Older adults with high openness to experience may want to continue their engagement in new experiences and social activities. This may be a challenge for older adults living with cancer and cancer-related pain. Older individuals with high openness to experience may report frustration, anxiety, and depression at their physical limitations. Further, individuals with high openness to experience may be more sensitive to the

negative outcomes of disease progression or changes in treatment. These individuals who are limited by their illness may employ maladaptive coping strategies (e.g., avoidance, disengagement), have heightened awareness of symptoms and higher reports of pain (Goubert, Crombez, & Van Damme, 2004; Hill & Gick, 2011).

High openness to experience as a predictor of average pain may also be related to the educational level of the sample. Since the majority of the sample was well-educated, they may be more proactive in seeking information regarding their illness. While it is beneficial to be informed, the results suggest that individuals with high openness to experience may report higher pain because they may tend to be hypervigilant of their symptoms and frustrated from possible physical limitations caused by their symptoms. This hypervigilance may be associated with pain catastrophizing, defined by an exaggerated negative orientation toward actual or anticipated pain experiences. In turn, this catastrophizing may lead to anxiety and worry and increased reports of pain. Furthermore, these negative emotions may stimulate neural systems that may increase sensitivity to pain (Gatchel, Peng, Peters, Fuchs, & Turk, 2007).

Agreeableness

High agreeableness was associated with self-efficacy for pain management. Individuals with high agreeableness are trusting, tolerant, and altruistic, often inhibiting their negative feelings (Carver & Connor-Smith, 2010; McCrae & John, 1992). These individuals often report high positive emotions and are more easy-going than individuals with low agreeableness. The findings suggest that agreeableness may be positively related to the concepts of self-efficacy in cancer patients. Since these individuals hold

considerable faith in others, they may be more likely to trust their physicians, their analgesic regimens, and their own efforts to manage their pain resulting in higher self-efficacy for pain management. Similar to extraversion, individuals with high agreeableness also tend to have large social networks, resulting in better coping and confidence that they may manage their cancer-related pain.

Another explanation may be that individuals high in agreeableness tend to have positive health perceptions. These positive health perceptions may increase self-efficacy for pain management. Agreeableness has been linked to positive affect and well-being and to less cynicism about health resulting in better perceived health status and self-efficacy (Boyce & Wood, 2011; Lockenhoff et al., 2008). Furthermore, previous studies have found individuals with high agreeableness reported fewer medical problems and made fewer visits to their general practitioner (Jerram & Coleman, 1999; Lockenhoff et al., 2008). This lower utilization of health services and lower symptom reporting suggests that individuals with high agreeableness may have the confidence to control their pain and have positive health outlook.

Individuals low in agreeableness are often antagonistic, have negative emotions, and tend to compete than cooperate. Low agreeableness has been associated with low reports of medical problems, expressed lack of vitality, higher physical limitations, and reduced clinical visits, which may affect self-efficacy for pain management (Jerram & Coleman, 1999; Lockenhoff et al., 2008). An individual with low agreeableness and a strong self-efficacy for pain management may ignore physician recommendations and rely on their own efforts and coping skills. These independent attempts at pain

management may be counterproductive, resulting in higher pain severity and lower self-efficacy for pain management.

There may be some bias and cohort effects regarding the association between high agreeableness and self-efficacy for pain management. First, longitudinal studies have found that agreeableness increases with age resulting in higher agreeableness in the sample (Lucas & Donnellan, 2011). In addition, being older adults, they may have better coping skills, positive outlook, and resiliency than younger cohorts (Gooding, Hurst, Johnson, & Tarrier, 2012). In older patients, cancer pain may be considered one more difficulty in a lifetime of challenges. With coping skills and resiliency that comes from positive and negative life experiences, they may have more confidence to manage their pain. This idea of resiliency can also be applied to potential coping differences and self-efficacy between White and Black patients.

Conscientiousness

Conscientiousness was found to be a significant moderator in the relationship between self-efficacy for pain management and worst pain severity. Further, individuals with low conscientiousness reported the highest worst pain severity compared to those with high conscientiousness. Conscientiousness, a trait defined by competence, personal reliability, and self-discipline, has been linked to various health behaviors including adherence to medical regimens, cancer screenings, and cancer treatment choices (Block et al., 2007; Dahl, 2010; Hill & Gick, 2011). High conscientiousness has also been linked to longevity and positive health behavior in older adults (Block et al., 2007; Weiss & Costa, 2005).

Low conscientiousness may lead to unhealthy behaviors such as avoidance of necessary medical attention in the sample. Higher reported worse pain severity may be a consequence of lowered adherence to analgesic regimens, reduced positive health behaviors, and reduced health service utilization in individuals with low conscientiousness. Individuals with low conscientiousness may lack problem-solving skills and the will power to fulfill a given task (analgesic adherence), thus presenting as being less competent in their ability to reduce their pain. Another explanation may be the sample was receiving treatment for a life-threatening illness, causing a reduction in general goal-driven behavior, or less concern about specific symptoms.

Conscientiousness reduced the relationship between self-efficacy for pain management and reported worst pain severity. One explanation for the moderation effect may be that conscientiousness is associated with low stress exposure and high self-control behaviors. Conscientious individuals typically plan for predictable stressors and regulate their behavior that can lead to health problems (i.e., pain). Conversely, low conscientiousness predicts high stress exposure, reduced appropriate health-promoting behaviors, and lower self-rated health (Hill & Gick, 2011; Jerram & Coleman, 1999). Low conscientiousness may reduce an individual's belief and competence that pain can be managed and appropriate health-promoting behaviors, resulting in higher pain severity.

Age effects may also be a factor in the relationship between conscientiousness, self-efficacy, and worst pain severity. With the older sample, they may have accomplished more of life's milestones (raising a family, having a career) compared to younger patients resulting in overall lower conscientiousness. Further, living with other

comorbidities, such as osteoarthritis, may further reduce feelings of goal-directed behavior and competence, increasing reported pain severity. For example, in individuals with high disease burden, poor health reports from oncologists may lower pro-health behaviors (adherence to medication), creating a sense of helplessness (lower self-efficacy) or inevitability over health declines. These unhealthy behaviors and decreased self-efficacy may increase pain severity.

Neuroticism

Results showed that neuroticism was not a significant predictor of reported pain severity and self-efficacy for pain management. Neuroticism, a trait defined by anxiety, hostility, and anger, has been found to be a predictor of cardiovascular disease, cancer onset, chronic pain, and maladaptive coping styles (Dahl, 2010; Lahey, 2009; Torgersen & Vollrath, 2008).

One potential explanation as to why neuroticism was not a significant predictor may be due to an age effect. Studies have found that neuroticism decreases with increasing age (Friedman et al., 2010; Mottus et al., 2012). The age-related decline in neuroticism is attributed to two perspectives of coping in older adults: lessened reactivity to stress and lower daily stress. The socioemotional selectivity theory proposes that over time, older adults cope with stress more effectively and become less reactive to stress (Carstensen, Isaacowitz, & Charles, 1999). This age-related increase of emotion regulation may be influential in coping with cancer-related pain. Similarly, neuroticism may be lower in older adults because they have lower work-related and family-related demands, both of which are sources of daily stress for midlife and young adults (Mroczek

& Almeida, 2004). Also, underreporting and positive bias may be present given that “positive” personality traits, high extraversion and high agreeableness, were reported at higher rates than negative traits like high neuroticism.

Race Differences in Personality

Positive and negative affect were measured to determine possible significant differences in personality traits between White and Black older cancer patients. There were no significant race group differences in the FFM of personality traits. These results are consistent with the current literature showing the lack of significant race differences in FFM of personality (Costa et al., 2001; Foldes et al., 2008, Lockenhoff et al., 2008). One reason why no differences were found in the FFM of personality may be the relatively homogenous patient sample. Although this result is encouraging, additional exploration of personality on a facet level (subdomain of each personality trait) would have been advantageous to identify possible race differences. Lastly, assessing personality through other personality measures such as positive and negative affect helped identify race differences in particular facets of personality.

Race Differences in Positive Affect

Results showed significant race differences in positive affect. Black patients reported higher excitement, attentiveness, alertness, determination, and inspiration than White patients. Previous research on race differences in affect have mixed results. Prior studies have found no significant differences in positive affect while others have found Blacks have greater positive affect than Whites (Brenes et al 2008; Skarupski, McCann,

Bienias, Evans, 2009). One possible explanation is older Blacks may have better external (social support) and internal (resiliency) resources than their White counterparts. Greater social support may explain why Black patients reported higher positive affect than White patients. Blacks may have more social support such as greater frequency and number of social contacts and higher amounts of fictive kin (unrelated individuals who have an emotional closeness similar to a family member) than Whites.

In addition to social support, Black patients may have reported higher positive affect due to higher resiliency. Older Blacks had to draw on internal and external resources to overcome a lifetime of inequality from the Jim Crow era to the present discrimination and racial segregation in the United States (van Wormer, Sudduth, & Jackson, 2011). This cumulative inequality throughout their lifespan may foster internal strength and strong external support systems. Further, this resiliency may be attributed to the crossover phenomenon, where an older minority embodies a combination of genetic heartiness, psychological strength, and successful coping skills (Baker, Buchanan, & Corson, 2008; Jackson, Antonucci, & Brown, 2003). These strengths may diminish the negative impact of cancer and aging thus resulting in higher positive affect.

Race Differences in Pain Severity

In addition to race differences in positive affect, being White was associated with higher current pain severity. This result appears to contradict the literature, which finds Black patients often report higher pain severity when compared to Whites (Anderson et al., 2009; Green, Montague, & Hart-Johnson, 2009; Reyes-Gibby, Anderson, Shete,

Bruera, & Yennurajalingam, 2012). This result may be due to racial differences in the reporting and coping with cancer-related pain.

Researchers have proposed that older minority patients may hide their pain or withhold communication if they do not feel a rapport with a health care professional or researcher (Limaye & Katz, 2006; Shea & McDonald, 2011). This reluctance may be further heightened during race discordant interviews. Race discordance, where a patient is not the same race as the physician or interviewer, has been considered a factor in cancer health disparities and may be a factor in the study. Black patients may have been less likely to express their negative views about physicians, pain treatment, and symptoms to the interviewers who they regarded as part of the health care system.

Studies exploring race concordant relationships (patient and physician are the same race) found healthcare providers are longer and more satisfying than race discordant relationships (Cooper et al., 2003; Van & Burke, 2000). Furthermore, studies have found that White physicians rated minority patients more negatively than White patients. It also found that White physicians viewed minorities as non-compliant and more likely to engage in risky health behaviors such as opioid abuse (Burgess et al., 2008; Van Ryn & Burke, 2000). Black patients may be reluctant to report pain because they fear being considered an “addict” by seeking out for pain medication (Burgess et al., 2008). Other barriers to reporting pain among Black patients include concerns about addiction and tolerance and limited availability of opioid analgesics in neighborhood pharmacies (Anderson et al., 2002; Green, Ndao-Brumblay, West, & Washington, 2005; Vallerand et al., 2005).

Another possible explanation may be racial differences in attitudes about reporting symptoms and pain-coping styles. Black patients may avoid reporting pain by remaining stoic (i.e., unemotional and indifferent to pain) (Anderson et al., 2002). In one study, over 75% of Black cancer patients agreed to some extent that one should be strong and not depend on pain medications (Anderson et al., 2002). This result reinforces the idea that pain is a subjective experience influenced by ethnicity and culture, shared attitudes, and values about behavior (Tan, Jensen, Thornby, & Anderson, 2005). In addition to being stoic, Black patients may rely not on their physician for pain management, but rather religiosity and social support more than Whites.

Study Limitations

The study found personality traits influence reported pain severity and self-efficacy for pain management in on older cancer patients. In addition, the study also found significant race differences in positive affect in White and Black cancer patients. Although the study was unique and contributed to the literature in several ways, there were several study limitations that must be acknowledged. First, this was a cross-sectional study therefore changes over time or establishing causal relationships in reported pain severity and personality could not be explored. Furthermore, personality was measured after diagnosis. Although personality traits should theoretically be consistent over time, possible changes in personality triggered by a diagnosis of cancer, such as higher neuroticism and lower positive affect, may occur (Dahl, 2010). It would have been advantageous to have a measure of personality traits prior to diagnosis to control for any possible changes after diagnosis. Additionally, measuring intraindividual

variations in personality through repeated measures may have resulted in more accurate reported personality traits. Finally, there was concern of the psychometric cost including low reliability with shortened measures of personality (i.e., TIPI). The study measures could have been supplemented with more reliable measures of the Five Factor Model of personality such the revised NEO Personality Inventory, a 240 item measure of the Five Factor Model (NEO-PI-R; Costa & McCrae, 1992) or the NEO-Five Factor Inventory, a 60 item measure of the Five Factor Model (Costa & McCrae, 1989).

The data was collected by self-report and not verified by patient medical records resulting in potential reporting bias such as social desirability. Social desirability is the tendency to present oneself favorably or obtain approval by responding in a socially and culturally acceptable manner (Paulhus & Trapnell, 2008). Social desirability responding in this sample may yield higher reported positive personality traits (i.e., high agreeableness and conscientiousness), higher self-efficacy for pain management, and lower pain severity. In addition, perceived pain severity is subjective, multidimensional, and can be influenced by physical, psychological, and social factors making it difficult to truly measure experienced pain.

Another limitation was the low number of Black patients in the sample. This small sample size limited race group comparisons and identification of significant predictors of pain severity and self-efficacy for pain management by race. The majority of the sample was White, well-educated, thus the generalizability to other cancer populations was limited. Furthermore, the selection criteria included all types of cancers; therefore, the results could not be similarly generalized to studies focusing on a specific diagnosis(es). This limitation can be positive in that the study explored pain severity,

self-efficacy for pain management, and the personality traits of a large outpatient population from a leading cancer center. Although this study recruited its sample mainly from Moffitt Cancer Center, a National Comprehensive Cancer Center, results from this study cannot be generalized to patients receiving outpatient services from community hospitals or clinics.

Another limitation was the lack of quality of care measures, in particular the quality improvement guidelines for the treatment of cancer pain. Although outside the scope of this project, future studies can explore the patient involvement in their pain management, treatment patterns, and pain management performance measurement to better understand the patient and provider factors that may influence reported pain severity (Gordon et al., 2005).

An additional study limitation was the lack of data on the effects of Medicare and Medicaid. Previous studies have found that Medicare and Medicaid often failed to facilitate, and in some circumstances actually discouraged, the provision of adequate pain management services (Jost, 2000; Manchikanti, 2006). Additional research is needed to explore how insurance and socioeconomic status influenced reported pain severity, personality, affect, and self-efficacy for pain management.

Future Directions

The study results lead to further exploration of the influence of personality on older diverse cancer patient populations and begin to address to the huge gap in the literature that have focused primarily on younger White participants with cancer. Future studies should include Hispanic and Asian participants in addition to more Black

participants to increase generalizability to the patient population. Studying older diverse patients will provide more essential information about a population who is most at risk for cancer and the undertreatment of cancer pain. Further examination of appraisals, beliefs, coping, and adjustment to chronic pain while accounting for patient-physician relationships and pain medication adherence of older Blacks and Whites is needed to better understand race differences in reported cancer-related pain.

In addition, comparisons of cancer-related pain by other sociodemographic variables such as age group, gender, ethnicity, income, and education may further identify additional groups at risk for disparate pain management. Lastly, race discordance or concordance in participant interviews needs to be further examined to explore any potential reporting bias. Future studies need to identify how interviewer race, age, gender, and occupation may influence patient communication of their cancer-related pain.

Future studies should replicate the survey in multiple sites including community-based hospitals and clinics that treat individuals of lower socioeconomic status. By targeting those individuals, researchers can better understand and disentangle any possible associations between pain severity and personality while accounting for influential sociodemographic variables such as socioeconomic status, insurance status, race, age, and education. Furthermore, recruitment efforts in multiple sites may help equalize the amount of White and non-White participants, also increasing generalizability.

In addition to replicating the study in a racially and socioeconomic diverse sample, it would be advantageous to conduct focus groups asking about individual experiences of pain, perceptions of treatment, personality, mood, types of coping, and

possible barriers to pain management. This mixed methods approach will be useful to identify themes in pain management and may further help explain how personality influences reported pain severity and self-efficacy for pain management. Furthermore, it would be beneficial to include measures of anxiety and depression in addition to personality to better understand the psychological predictors of reported pain severity and self-efficacy.

Measuring personality at the trait level may be too simplistic. Future studies need to explore possible age, gender, race, and ethnic differences at the facet level (subdomain of personality traits as described by Costa & McCrae) of personality traits, instead of the broad trait level, which may suggest different developmental, social, and cultural influences. For example, even though mean levels of the trait agreeableness may not differ between Whites and Blacks, its expression as straightforwardness, modesty, and compliance can be influenced by the differing social and cultural experiences of racial and ethnic groups (Costa et al., 2001; Foldes et al., 2008). Lastly, further investigation into possible personality dyads (high extraversion and high neuroticism) may be beneficial to explore how different personality combinations influence symptom reporting in different race groups.

The utilization of a longitudinal model can provide opportunities for analyses for change over time (e.g., repeated measures ANOVA, ANCOVA) to further explore the proposed relationship between pain severity, personality traits and facets, and self-efficacy for pain management. By using longitudinal models, research can measure the trends of pain severity, patient personality, and self-efficacy for pain management.

Longitudinal designs allow the assessment of the stability and change in personality within and between groups.

After identifying predictors of reported pain severity, the next step would be to create and test a psychoeducational pain management intervention by personality type, an application never done in patients with cancer. This intervention should consist of a racially diverse older adult sample from multiple treatment locations in order to recruit racially and socioeconomic diverse participants thus testing cultural sensitivity, feasibility, and overall efficacy. By creating personalized psychoeducational interventions by personality type, clinicians and researchers can pinpoint at risk individuals for pain and individuals with unresolved pain, to hopefully reduce physical and emotional distress.

Previous psychoeducational interventions on pain management have resulted in significant reductions in pain severity, increased knowledge of pain management, increased sense of control and quality of life, decreased use of health care services, and faster post-surgical recovery (Hyer, Brown, Krok, Akins, & Keefe, 2010; Kim et al., 2004; Langford et al., 2011; Miaskowski, 2010; Schumacher et al., 2002a; Schumacher et al., 2002b). These findings implicate the potential for high cost reductions and decreased demand for services, which may be beneficial for patient populations, hospitals, and insurance companies regarding the management of cancer pain.

Conclusion

The relationship between patient personality and cancer pain severity is greatly understudied in the literature. However, results from this study add to the limited research

exploring how different personality traits influence reported pain severity in patients receiving outpatient treatment for cancer. In addition, personality was also found to affect self-efficacy for pain management, an important part of coping and managing cancer-related pain.

This study is also unique because it focused on an older adult sample. It is important to study older adults with cancer because they are disproportionately affected by cancer, from an increased risk of cancer to undertreatment of pain. However, few previous studies have focused on older patient samples from a social science perspective.

Cancer-related pain is a biopsychosocial experience and all aspects are integral to the way a person feels, reacts to, reports, and manages their pain. It is not likely that just one factor will fully explain susceptibility and reactivity to pain. Personality accounted for part of the variance so it should not be ignored when studying cancer pain and self-efficacy for pain management of older outpatients.

This study also demonstrated the relationship among between physical (pain) and psychological (self-efficacy, personality) functioning and sociodemographic factors such as race. The limited amount of studies that have focused on race differences in personality relate to personnel fit and performance. However, the results from this study demonstrate the importance of measuring race differences in biopsychosocial variables such as personality, self-efficacy, and pain. Race differences in the pain experience, patient-physician relationships, and coping styles should be measured and addressed by a multidisciplinary cancer pain management team in order to reduce disparities in the treatment of cancer-related pain.

These findings have several implications for clinical practice. First, they highlight

the importance of addressing physical and psychological variables that can complicate patients' ability to engage in recommended pain management activities. Better adherence to these regimens could improve physical and mental health status, possibly leading to reduced pain. Identifying predictors of pain such as extraversion and conscientiousness, clinicians and researchers can identify "at risk" patients in hopes of employing more effective strategies to promote patient communication of symptoms and adherence to pain management regimens.

Additional research regarding personality's influence on cancer-related symptoms is needed to assist healthcare professionals in providing comprehensive care to patients while alleviating psychological and health-related symptoms. Furthermore, it is important that researchers expand future research efforts to focus on the needs of older adults, considering the prevalence of adults 65+ years of age diagnosed with cancer. In addition, the growth of a diverse older adult population warrants studies to include minority samples that explore racial differences in cancer pain, self-efficacy for pain management, and personality.

This research offers a new perspective on individual factors that influence cancer pain management. No previous studies have focused on personality of older outpatients with cancer despite its established and extensive influence on health. This study's results point towards the necessity of considering personality traits in large-scale epidemiological studies of disease and morbidity to better characterize at-risk populations and increase the likelihood of constructing informed and effective prevention, interventions, and policy initiatives.

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APPENDIX I: KEY TERMS

1. Acute Pain- pain that is short lasting and typically manifests in ways that can be easily described and observed. It can last for several days, increasing in intensity over time or it can occur intermittently (Jansen, 2008).
2. Affect- the experience of feeling or emotion in a given time. As time increases, these emotional states can be considered traits. Common examples of affect are sadness, fear, joy, and anger. The normal range of expressed affect varies considerably between different cultures and even within the same culture (Gilboa & Reville, 1994).
3. Agreeableness- personality trait of the Five Factor Model that includes facets such as modesty, conventionality, trust, altruism, kindness, honesty, and other prosocial behaviors (Costa & McCrae, 1989; John et al., 2010).
4. Average Pain- typical, daily amount of perceived pain. Although important, average pain is less dependable or reliable than end points of reported pain (i.e., least and worst pain) (Abrahm, 2005).
5. Breakthrough Pain- intermittent exacerbations of acute pain that can occur spontaneously or in relation to specific activity, often on a background of well-controlled chronic pain (Abrahm, 2005; U.S. Department of Health and Human Services, 1994).
6. Cancer-related Pain- pain with acute, chronic, and psychological aspects experienced by cancer patients. Associated with the disease process and treatment (Jonas, 2005).

7. Chronic Pain- pain that lasts for more than 3 months. It is much more subjective and not as easily described as acute pain. It often involves often involves persistent pain and breakthrough pain (American Cancer Society, 2012).
8. Conscientiousness- personality trait of the Five Factor Model that includes high levels of thoughtfulness, with self-discipline and goal-directed behaviors. Those high in conscientiousness tend to be organized and detail-oriented (Costa & McCrae, 1989; John et al., 2010).
9. Current Pain- pain you are experiencing in the present. Can be chronic, acute, and/or breakthrough pain. (Hadjistavropoulos & Hadjistavropoulos, 2008).
10. Disparity- The condition or fact of being unequal, as in age, rank, or degree; difference (Editors of the American Heritage Dictionaries, 2011).
11. Extraversion –personality trait of the Five Factor Model that includes facets such as gregariousness, assertiveness, activity, excitement-seeking, positive emotionality, and warmth (Costa & McCrae, 1989; John et al., 2010).
12. Facet- a subdomain or subtrait of a personality trait of the Five Factor Model. There are six facets of personality associated with each trait. For example, extraversion's six facets are friendliness, gregariousness, assertiveness, activity level, excitement-seeking, and cheerfulness (Costa & McCrae, 1989).
13. Five Factor Model- widely-used model representing a range between two extremes of five personality dimensions: Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Evidence of this theory has been growing over the past 50 years, beginning with the research of D. W. Fiske (1949)

- and later expanded upon by other researchers including Norman (1967), Goldberg (1981), and McCrae & Costa (1987). (John et al., 2010).
14. Least Pain- lowest amount of pain experienced by a person with chronic pain within a given time period. Pain can be lowered to the least amount through analgesics and/or non-pharmaceutical methods (e.g., relaxation, exercise) (Hadjistavropoulos & Hadjistavropoulos, 2008).
 15. Older Adult- the chronological age of 65 years. In some circumstances (e.g., countries with low life expectancy, cancer patient populations) being considered an older adult has different cutpoints and may have be lowered to 55 or 60 years of age (World Health Organization, 2011).
 16. Openness to Experience- personality trait of the Five Factor Model features characteristics such as insight and imagination, and those high in this trait tend to have a range of interests, liberal values, and an appreciation for aesthetics (John et al., 2010; Costa & McCrae, 1989).
 17. Medicaid- state-administered health coverage available to certain individuals who have limited income and resources (Centers for Medicare and Medicaid Services, 2011).
 18. Medicare- health insurance for people 65 and older, people under 65 with certain disabilities, and people of any with End-Stage Renal Disease. Medicare is divided into four parts: Part A, inpatient care in hospitals, skilled nursing facilities, hospice and home health care; Part B, outpatient, physician, and preventative services; Part C, health plan options run by Medicare-approved private insurance companies to help

- get the benefits and services covered under Parts A & B; Part D, prescription drug coverage (Centers for Medicare and Medicaid Services, 2011).
19. Minority- a sociological group of people within a certain demographic. The demographic could be based on many factors from ethnicity, sex, wealth, power, etc. The term, minority, can be described as a group of people numerically smaller than the rest of the population, not in a dominant position, and have culture distinct from the general population (Smihula, 2009; Smedley, Stith, & Nelson, 2002).
 20. Negative Affect- predisposition to experience relatively excessive negative emotions. It is a general dimension of subjective distress and unpleasurable engagement that includes a variety of aversive mood states including anger and fear (Watson et al., 1988).
 21. Neuroticism- personality trait of the Five Factor Model comprised of several facets: anxiety, hostility, anger, depression, self-consciousness, vulnerability, moodiness, and impulsiveness (John et al., 2010; Costa & McCrae, 1987).
 22. Pain- a subjective, multidimensional unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (IASP Press, 1994).
 23. Pain Severity- sensory dimension of pain; a primary factor that determines the impact of pain on a patient. This component of pain most studied in clinical practice and pain management outcomes research. Multiple tools exist for the measurement or quantification of pain severity including the Numeric Rating Scale (0-10 points) (Jones, Vojir, Hutt, & Fink, 2007; Serlin, Mendoza, Nakamura, Edwards, & Cleeland, 1995).

24. Personality- an individual's characteristic patterns of thought, emotion, and behavior, together with the psychological mechanisms--hidden or not--behind those patterns (Funder, 2001).
25. Positive Affect- predisposition to experience relatively excessive positive emotions. Positive affect reflects the extent to which a person is alert, enthusiastic, and active (Watson et al., 1988).
26. Reported Pain- subjective level of pain as told to the physician, researcher, family, etc. Reported pain can differ from experienced pain and can be influenced by multiple factors include individual pain tolerance, age, sex, culture, religious beliefs, psychological functioning, medications, environment, etc (IASP Press, 2005).
27. States- temporary behaviors or feelings that depend on a person's situation and motives at a particular time that are sensitive to change within the individual (Eysenck, 1983).
28. Trait- characteristic behaviors and feelings that are stable across a lifetime that differentiate subjects from each other (Eysenck, 1983).
29. Worst Pain- highest amount of pain experienced by a person with chronic pain and/or breakthrough pain within a given time period. Pain can be increased due to a vast number of causes including medical tests, treatments, the cancer itself (i.e., tumor), spinal cord compression, movement, emotional states, etc (Hadjistavropoulos & Hadjistavropoulos, 2008).