

Characteristics Affecting Medical Consultation or  
Non-Consultation for Chronic Pain in Adults in the United States

A Thesis

Presented to the Faculty of the Graduate School  
of Cornell University

In Partial Fulfillment of the Requirements for the Degree of  
Master of Arts

by

Emily Kahoe Chen

January 2012

© 2012 Emily Kahoe Chen

## ABSTRACT

Chronic pain (CP) is a prevalent and debilitating chronic condition, but nearly one in five people with CP do not consult a health care profession for their symptoms. This thesis addresses the extent and characteristics of non-consultation for CP in the United States. I develop a model of non-consultation for people reporting CP that is informed by a biopsychosocial perspective. This preliminary model proposes that symptoms, individual and social characteristics, and access to health care jointly contribute to the choice to consult a health care provider about CP. This model is tested in a large, national sample of adults, the MacArthur Study of Midlife in the United States II (MIDUS II). Results indicate that severity of pain symptoms and having health insurance are the most influential factors predicting consultation for CP. This is consistent with previous research on care-seeking for CP and theories of medical care usage that are not specific to CP. Despite the pertinence of a biopsychosocial perspective on the pain experience, measures that represented the social and psychological context of pain were not significant predictors of non-consultation for CP.

## BIOGRAPHICAL SKETCH

Emily Kahoe Chen is a graduate student in the department of Human Development at Cornell University. Emily has an A.B. from Bryn Mawr College in the Growth and Structure of Cities. Prior to arriving at Cornell, she worked in public policy research at the University of Pennsylvania and The Reinvestment Fund.

## ACKNOWLEDGMENTS

I would like to thank Karl Pillemer and John Eckenrode for their constructive and supportive guidance and feedback throughout the inception and writing of this thesis.

## TABLE OF CONTENTS

Overview of Chronic Pain .....	1
Definitions .....	1
Explanations .....	3
Life with Chronic Pain .....	6
Non-Consultation for Chronic Pain .....	11
Who Consults for CP? .....	14
Research Questions .....	18
Methods .....	19
Results .....	25
Discussion .....	30
Conclusions and Significance .....	35
References .....	37
Tables and Figures .....	44

Chronic pain (CP) is a common, disabling, and costly condition (Gatchel & Mayer, 2000). Research on CP has focused on samples from pain treatment centers or patients in ambulatory care settings, but not all people who report CP consult with a doctor about their pain (Nguyen, Ugarte, Fuller, Haas, & Portenoy, 2005; Watkins, Wollan, Melton, & Yawn, 2006). Consequently, very little is known about people with CP who do not seek medical treatment, especially in the United States. This study uses a large random sample of the general population in the United States to describe people with CP who do not consult a health care professional for pain, compare them to those who do consult, and construct a statistical model to quantify how both individual and social-structural factors contribute to one's odds of not consulting for CP. CP is debilitating and greatly affects quality of life, but effective treatment of this condition at a population level requires understanding the proportion and characteristics of people with CP who are not seeking health care for their pain. In addition, identifying differences between consulters and non-consulters clarifies the limitations and generalizability of research findings from pain treatment populations.

## **Overview of Chronic Pain**

### **Definition**

The International Association for the Study of Pain defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (p. 210, Merskey, 1994). The IASP definition of pain further elaborates that pain is subjective; although tissue damage might be occurring at the physiological level and nerve responses indicate this damage to the brain, pain itself is the cognitive and affective response that results. In common usage, the idea of physical pain is inseparable from an identifiable cause, but pain research distinguishes between nociception – the neural processes

that encode and process a tissue damaging event -- and pain, our affective response to nociception, which then prompts pain behaviors, like wincing or holding the site that hurts (Loeser, 1982). The manner in which we interpret and express painful sensations is shaped by cultural context (Zborowski 1952, 1969). Although pain is often caused by an identifiable aversive stimulus, the same tissue damage may cause varying degrees of pain in different people, and it is possible to experience bodily pain in the absence of identifiable noxious stimuli. Theories explaining the latter case are discussed below.

This article deals with chronic pain (CP) as contrasted with acute pain. Chronic pain (CP) is defined as pain that persists beyond the time of usual healing (Bonica, 1953), where the time allowed for healing usually falls between one and six months (Merskey, 1994), with three months often used in surveys of CP prevalence. CP can be the result of a wide range of causes, identified and unidentified, and the only consistent diagnostic criteria is the duration of persistent pain.

The umbrella of CP conditions includes several specialized areas of research that can make comparing the literature on CP difficult. For example, studies of “benign chronic pain disorder” (see Verhaak et al., 1998 for a review) and “unexplained severe chronic pain” (Kerssens, Verhaak, Bertelds, Sorbi, & Bensing, 2002) distinguish CP with no known cause from the larger set CP from all (known and unknown) causes. Other studies that focus on this type of pain may refer to them as idiopathic pain or somatoform pain (Merskey, 1994). Another prominent strain of CP pain research focuses on “chronic widespread pain”, also known as fibromyalgia syndrome (e.g. Croft, Rigby, Boswell, Schollum, & Silman, 1993), the diagnostic criteria for which is widespread pain (upper and lower body, left and right side) and somatic symptoms (fatigue, waking unrefreshed, cognitive symptoms) beyond a diagnostic threshold



level (Wolfe et al., 2010). Standard clinical definitions of CP exclude pain related to cancer, as it is assumed that the pain condition is not the primary outcome of interest in cancer treatment (Merskey, 1994). Most surveys of pain rely on self-reports of pain that do not specify a cause.

Regardless of how it is defined, CP is a heterogeneous phenomenon. The areas of the body most often affected are the back, including the neck and shoulder area, but pain is also commonly reported in the lower extremities, head and face (including headache), and abdomen (Andersson et al., 1993; Crook, Rideout, Browne, 1984; Verhaak et al., 1998). Multiple pain sites are often reported as well (van der Windt, 2010). Common conditions that can produce chronic pain are osteoarthritis, rheumatoid arthritis, back pain and back-related conditions like spinal stenosis and sciatica. Tension headaches and traumatic injury can also cause chronic pain, although the etiology of these conditions is often unknown. Fibromyalgia is a syndrome of widespread pain with no known cause where a threshold level and extent of pain, but no other symptoms, is the criteria for diagnosis (Wolfe et al., 1992). This diversity within the CP population represents a challenge when trying to summarize across people with the condition.

For the purposes of this study, CP is defined as any pain that persists for more than three months, as self-reported by individuals. In order to fully utilize the existing research on CP, the literature on all types and subsets of CP is summarized.

## **Explanations**

### *Contemporary Theories on the Physiology of Pain*

Some conditions that produce CP have organic and identifiable origins that cause pain on with intensity to be expected for the condition. For example, osteoarthritis – pain, stiffness, and swelling in joints due to the deterioration of cartilage – is a common cause of CP. Understanding CP from unknown causes, or pain that exists disproportionately to detectable causes, has been

more challenging. Modern theories of pain acknowledge that pain is nearly always triggered by tissue damage, but they also allow for the nervous system and the brain (through cognition and emotion) to amplify or modulate the subsequent pain experience that is the response to that tissue damage. Through these means, individuals with clinically similar levels of tissue damage can experience very different levels of pain.

The gate-control theory of pain was the first to present a plausible biological model for how this collaborative body-mind approach to the creation of pain is possible (Melzack & Casey, 1968; Melzack & Wall, 1965). The effect of this theory was that pain could no longer be conceptualized as a peripheral phenomenon where signals were passively received by the brain from nerve endings. Rather, the brain was dynamically involved in inhibiting, exacerbating, or modulating input (Melzack, 1999). By extension, allowing painful stimuli in the body to be modulated by the brain acknowledges that individual and cultural factors can heighten or reduce responsiveness to nociception.

The more recent neuromatrix theory of pain (Melzack, 1999) goes further in expanding the ways in which pain sensation can be created and experienced by proposing that a diffuse neural network (the neuromatrix) that can activate neural patterns of pain even in the absence of the somatic stimuli that instantiated the neural patterns. The classic example of this type is phantom limb pain, where pain is experienced in an amputated limb, or pain in the lower extremities of people with fully severed spinal cords. The neuromatrix theory of pain also asserts that the neural pathways that sense bodily harm and send signals to the brain can become miscalibrated or “pattern generating”, sending pain signals in the absence of noxious stimuli, or failing to stop sending pain signals after some acute pain episode. According to the neuromatrix theory of pain, the role of stress and over-activation of pain pathways are likely causes of some

types of CP, where stress of acute or persistent pain leads to CP syndromes. Both of these theories describe complex mechanisms behind pain that argue for the existence of authentic pain sensation and the emergence of CP in the absence of organic causes.

### *The Biopsychosocial Model and Chronic Pain*

The above theories attempt to explain the way that pain is generated and processed by the nervous system and the brain, but they do not consider the person and his or her social and cultural context. Because pain can be promoted or moderated by the collective somatic, cognitive, and affective experience of stimuli (Loeser & Melzack, 1999; Turk & Monarch, 2002), the traditional biomedical model of pain that prioritizes physiological evidence over the experience or context of the individual is inadequate (Engel, 1977). The biopsychosocial (BPS) model, however, affirms the interactive influences of biomedical, psychosocial, and behavioral characteristics and the necessity of dealing with all of these factors in the treatment of CP (Turk & Monarch, 2002; Turk & Okifuji, 2002). At the biological level, the BSP does not debate the neuroscience of pain, but views it as a component of CP rather than a determinant (Gatchel et al., 2007). Another equally important component is the role of emotion and cognitive factors in shaping the pain experience and outcomes, including learned behavior (Turk & Monarch, 2002). Beliefs about the meaning of pain, responses of family and friends to one's pain behaviors, expectations for treatment and recovery, and other individual and contextual forces interact and jointly influence an individual's experience of CP. The BPS approach to CP is wholly compatible with the biological models of pain (i.e. gate-control theory and the neuromatrix theory) while providing a framework for understanding the many factors that influence the experience of the CP population.

## **Life with Chronic Pain**

The theoretical and empirical research attention that CP has received should not crowd out the challenges of and poor outcomes associated with this condition, especially because it is common. Large surveys of community-dwelling individuals estimated the prevalence of CP to be around 20% (Blyth et al., 2001; Breivik et al., 2005; Catala et al., 2002; Gureje et al., 1998; Von Korff et al., 2005), with some studies finding higher rates of between 35% and 55% (Andersson et al., 1993; Buskila et al., 2000; Elliott et al., 1999). Most research indicates that CP is more common in women than men (Blyth et al., 2001; Breivik et al., 2005; Crook, Rideout, Browne, 1984), although some studies have found no gender difference (Andersson et al., 1993). Reports of CP increase with age, with some evidence for a peak in middle-age people (Andersson et al., 1993; Crook et al., 1984; Verhaak et al., 1998). There is consistent evidence that CP is more prevalent in lower income groups (Verhaak et al., 1998). Reporting pain has also been associated, not surprisingly, with blue collar and agricultural employment (Andersson et al., 1993).

A central challenge of living with CP is carrying on with everyday activities despite pain, including paid work. CP is often declared research-worthy because it is costly to society in the form of lost wages and lost workplace productivity (Gatchel, 2004). In fact, CP is a leading cause of work absences (Andersson, 1999; Buskila et al., 2000) and all forms of pain are a common cause of reduced worker productivity (Stewart, Ricci, Chee, Morganstein, & Lipton, 2003). These global accounts of the impact of CP aggregate but should not mask the frequent physical limitations and disability experienced by individuals with CP and the inevitable spillover into paid work that causes lost time and wages for individuals as well as society. People with CP report being unable or less able to work outside the home than their pain-free peers

(Breivik et al., 2005) and are more likely to be unemployed than people without CP (Bylth et al., 2001; Carey, Evans, Hadler, Kalsbeek, McLaughlin, and Fryer, 1995). Compared to transitory or short-term pain, CP has been associated with higher rates of sick leave or early retirement (Buskila et al., 2000; Gerdle, Björk, Henriksson, & Bengtsson, 2004). Perhaps more alarming, in a European survey of people with CP, 19% of respondents with CP reported that they had lost a job because of their pain (Breivik et al., 2005). Slightly lower percentages of people with chronic regional pain (6%) and chronic widespread pain (9%) reported that they had to quit their job because of pain, in a survey of the general population in Israel (Buskila et al., 2000).

### *Psychological Correlates of Chronic Pain*

In addition to affecting one's livelihood, CP is distressing and may have psychological consequences. The relationship between CP and psychological symptoms has been well-documented (Dersh, Polatin, & Gatchel, 2002). Most studies on this topic observe the association between depression and CP in cross-sectional data, frequently by looking at the pain symptoms of depressed people or the psychological well-being of people in pain treatment centers (Romano & Turner, 1985). In a random population sample, it is estimated that 18% of people with CP having clinically meaningful levels of depression symptoms, compared to only 8% of the non-CP population (Magni, Caldieron, Rigatti-Luchini, & Merskey, 1990).

Consensus about whether depression precedes or is secondary to pain has only recently been reached. Compelling evidence for a bi-directional nature of the relationship between pain and depression is given by Magni and colleagues (1994). Looking across two waves of the National Health and Nutrition Survey of the United States, depression at the first time point more than doubled a respondents odds of reporting chronic musculoskeletal pain at the second time point eight years later (Magni et al., 1994). Evidence was found in the other direction as well,

where CP at Time 1 increased the odds of depression at Time 2 by a factor of 2.85. The authors concluded that depression promotes pain and pain promotes depression over this time period, although both findings explained only a small percentage of the variance in outcomes. It is likely that the pain-depression association operates in both directions, functioning differently in different sub-groups of CP patients; although some people may experience CP as a symptom of depression, others may experience depression secondary to CP (Fishbain, Cutler, Rosomoff, & Rosomoff, 1997; Linton, 2000; Ohayon & Schatzberg, 2003; Romano & Turner, 1985).

Although research has largely focused on the link between pain and depression, anxiety disorders are also strongly associated with CP in cross-sectional data (Benjamin, Morris, McBeth, MacFarlane, & Silman, 2000; McWilliams, Goodwin, & Cox, 2004). Some argue that CP is primarily a psychosocial dysfunction (Andersson, 1999). In fact, Pain Disorder is listed alongside Hypochondriasis, Conversion Disorder, and Somatization Disorder as a type of Somatoform Disorder in the DSM-IV-TR (American Psychiatric Association, 2000). The mechanism for this association may have some biological basis, but the dominant assumption is that the link is cognitive-behavioral (Romano & Turner, 1985).

Psychological distress can be expected with any chronic condition, but anxiety and depression with or in response to CP may negatively impact outcomes. Ways of coping and how one adjusts to life with CP are one pathway through which this relationship is thought to operate (Keefe, Rumble, Scipio, Giordano, & Perri, 2004). Beliefs about pain and pain cognitions can result in fear-based avoidance of activities, pain catastrophizing, and passive coping, all of which are associated with increased pain and pain-related disability (Linton, 2000; Turk & Okifuji, 2002). The conversion from an acute episode to full-blown chronic pain also gives clues as to the way that behavioral and cognitive factors can cause benign CP. Fear of pain, pain-related

anxiety, and concern that pain indicates organic harm, can inhibit recovery from acute pain episodes (Turk & Okifuji, 2002). Excessive use of techniques appropriate to treat acute pain, like rest, can cause pain because the muscles atrophy and joints become stiff. This physical “deconditioning syndrome” makes movement painful, which prompts immobilization, perpetuating a cycle of pain and disability (Mayer & Gatchel, 1988). The impact of psychosocial factors on pain is mostly realized in increased pain-related disability (Keefe et al., 2004; Linton, 2000).

### *Medical Services and Treatment*

If CP presents many challenges to the well-being of people with the condition, what recourse is available to treat or abate CP through medical treatment? There are a wide range of medical treatments and therapies for CP, each varying in their effectiveness depending on pain type and individual case. CP is commonly treated with pain medications, ranging from mild over-the-counter analgesics, like acetaminophen (paracetamol) and NSAIDs, to stronger prescribed versions of these or opioids. Anesthetic can also be introduced directly into affected areas through injections or minor surgical procedures, creating what is known as a nerve block, which provides in most cases temporary pain relief from a few days to a few months before having to be repeated. Although most people with CP used some form of medication to manage their pain (Breivik et al., 2003; Haetzman, Elliott, Smith, Hannaford, & Chambers, 2003), the long-term use of pain medication often has troublesome side effects, like stomach irritation or increasing tolerance that makes pain medications less effective over time. The most promising outcomes for management of CP have been seen in multidisciplinary pain treatment centers that teach and administer a combination of pain management therapies and techniques to help patients improve and maintain functioning despite ongoing pain (Flor, Fydrich, & Turk, 1992).

People with CP use more health care services than people without CP, likely because they are seeking relief from what is often an intractable condition. Cross-sectional studies of pain patients use of health care services have consistently found that characteristics of pain (intensity, persistence) relate to higher utilization of health care services (Crook, Rideout, & Browne, 1984; Engel, VonKorff, & Katon, 1996; Jensen, Turner, Romano, & Lawler, 1994; Van Tulder, Koes, Metsemakers, & Bouter, 1998). Increasing pain and disability over time is associated with visits to primary care doctors (Peters, Sanders, Dieppe, & Donovan, 2005). Disability due to one's pain is the strongest predictor of health care services, including visits to primary care doctors and emergency room visits (Blyth et al., 2004).

Complementary and alternative medicines (CAM) and therapies, such as chiropractic, acupuncture, massage, and homeopathy, are also used for treating pain (Haetzman et al., 2003; Hart, Deyo, & Cherkin, 1995). Reports of CAM in the United States consistently report that back, neck, and joint problems are the most frequent issues for which alternative therapy were sought (Barnes, Powell-Griner, McFann, & Hahin, 2004; Eisenberg et al., 1998). The use of alternative therapies is most often addition to conventional care, and not to the exclusion of seeing allopathic doctors (Andersson et al., 1999; Barnes et al., 2004; Haetzman et al. 2003). Psychotherapeutic interventions have also been found to be effective in the treatment of CP (see Turk & Okifuji, 2000, for a review).



## **Non-Consultation for Chronic Pain**

Although use of health care services is higher in general for people with CP, there is substantial variation within the CP population, with some people with CP report never seeking health care services for pain. In a survey of CP in Europe and Israel, seven percent of respondents reported zero as the number of doctors who have treated them for pain (Breivik et al., 2005). Other studies offer similar estimates of non-consultation. In the landmark Nuprin study of pain, of people who reported severe (but not necessarily chronic) pain, 18% reported not seeing a professional about their pain because they did not think anyone could help (Sternbach, 1986). In a study of people 30 years and older who had contact with the health care system in the last three years, 22% of respondents who reported chronic pain had not informed their physician about their pain (Watkins et al., 2006).

Of studies that followed people with pain over time, only 21% of community-based subjects with self-reported shoulder-neck pain consulted their primary care physician for pain over a 2-year interval (Badcock et al., 2003), and just half of respondents with severe knee pain consulted their general practitioner over a 3-year study (Jordan, Jinks, & Croft, 2006). Evidence suggests that non-consulting patients are not randomly distributed within people who report CP, but are a identifiable subset. For example, when classified according to the West Haven-Yale Multidimensional Pain Inventory (classifications of dysfunctional, interpersonally distressed, adaptive copers, and a composite type that has features of the other three types), use of health care services differed according to sub-group (Verhaak et al., 2000).

### *Significance*

Understanding the characteristics of people who do not consult for CP and factors that predict non-consultation is important to both research and practice. First, what is known about

CP is overwhelmingly based on studies of people who are receiving treatment for CP despite findings that nearly 20% of people with CP have not consulted their doctor about pain. Although possible, it is unlikely that consultation is a random or evenly distributed behavior. Identifying differences between consulters and non-consulters may speak to the limitations and generalizability of research on pain treatment populations. Understanding what segment of the CP population is underrepresented in studies of treatment groups can guide more thorough investigations of this prevalent and unfortunate medical condition.

A thorough investigation of non-consulting for CP is also important from a public health perspective. Large numbers of people with a chronic and debilitating condition are not seeking medical care, but little is known about who these people are or the factors that influence consultation. In so far as medical consultation may improve the functioning of a person with CP – through medication, physical therapy, or referral to support groups -- identifying modifiable factors that could increase rates of consultation could reduce the high cost that CP has on individuals and our society as a whole.

### *Theoretical Framework*

Medical consultation for CP is clearly not universal, with non-consulters being identified in several large surveys of CP in the general population. Previous research on non-consultation has documented this phenomenon and explored some contributing factors, but has not offered theories of medical consultation specific to CP. To develop research hypotheses about the correlates of non-consultation for CP, I draw on two theories that describe CP and medical care use, respectively. First, I consider consultation for CP to be, like CP itself, a biopsychosocial phenomenon; consultation for pain is jointly determined by physiological symptoms, cognitive

appraisals, affective and emotional responses, and the social and environment context that could promote or inhibit the choice to talk to a doctor about pain.

Second, I draw on Andersen and Newman's (1973) theory of medical care utilization in the United States, which outlines three major determinants of an individual's health care use: the person's predisposition to use services (predisposing factors), his or her ability to obtain services (enabling factors), and the level of his or her illness (symptoms). Predisposing factors include demographic characteristics, social location, and beliefs about health and illness. Enabling factors include personal instrumental resources, like health insurance and income as well as availability of services. Characteristics of a person's illness, such number of days of disability, severity of symptoms, and general self-rated health affect medical care utilization. How the health care system receives the person's symptoms also affects health care use; if symptoms that are problematic to a patient are not legitimized with a diagnosis, or if the problems are not considered medical in nature, an individual will be discouraged from using health care services.

Andersen and Newman's (1973) model is similar to a social ecological or BSP approach to illness and care seeking, in that it considers the effects of personal, social, and environmental factors. I will review the literature related to the research question and frame the empirical investigation in terms of a provisional model, based on Andersen and Newman but extending some of their constructs in order to include aspects that a BSP framework would include. The working model also allows for factors to interact with each other, within and across levels. The provisional model asserts that consultation with a health care professional for CP is determined at (1) the individual level, based on disease characteristics, social position (age, gender, education), and personality factors; (2) the social level, through social support; and (3) the structural level, through access to medical care. Below I review what is known about non-

consultation for CP at each of the levels – individual, social, and structural – identified in this provisional model.

## **Who Consults for CP?**

### *Individual Level, Disease Characteristics*

Existing research on non-consultation for CP converges around the importance of pain characteristics in a person's decision to consult a doctor. (See Table 1 for a summary of related studies.) An association between characteristics of pain – intensity, duration, frequency, pain-related disability, interference with daily activities – and consultation for CP has been found in community-dwelling samples in Scotland (Elliott, Smith, & Hannaford, 2005), Australia (Blyth, March, Brnabic, & Cousins, 2004), Finland (Turunen, Mantyselka, Kumpusalo, & Ahonen, 2004), and Sweden (Andersson, Ejlertsson, Leden, & Schersten, 1999). In the United States, Von Korff, Wagner, Dworkin, and Saunders (1991), found that severity, persistence, and recency of onset of pain were associated with health care contact in a sample of participants from an HMO. Similarly, in random sample survey of US households, lower pain intensity and frequency were also associated with non-treatment of self-reported CP of all types (Nguyen et al., 2005) and chronic low back pain (Carey et al., 1995). Certain types of pain, like chest pain and multi-site pain, are more likely to be discussed with a doctor (von Korff et al., 1991; Watkins et al., 2006).

Prospective studies of medical consultation for specific pain types add to cross-sectional surveys on CP. Badcock and colleagues (2003) followed patients at a primary care practice who reported shoulder and neck pain on a survey questionnaire for two years. Consultation about shoulder or neck pain was related to more pain and disability on a follow-up survey. In an 18-month prospective study of severe knee pain, the likelihood of consulting a physician for knee problems was significantly higher for those with a history of knee injury and longer duration of

pain, but no effects were found for pain severity and pain-related disability (Jordan, Jinks, Croft, 2006). Blogojevic et al. (2008) report a similar pattern, where consultation for knee pain over a three-year follow-up period is more likely for people who continue to report knee pain at the end of the study period. Consultation with primary care physicians for pain conditions seems more likely for those with greater pain, although the measures of pain that are predictive of consultation – intensity, duration, disability, etc. – are not consistent.

### *Individual Level, Social Position*

Findings on the effects of age and gender on consultation for CP are mixed. In a Scottish sample, Elliot and colleagues (Elliott et al., 1999) found a self-described need for care for chronic pain, including medication and healthcare, was higher in women. In an 18-month prospective study of severe knee pain in older adults, the likelihood of consulting a physician for knee problems was also significantly higher for women (Jordan et al., 2006). The final finding in favor of gender differences in non-consultation for CP is a study in the US, where men were less likely to talk to their doctor's about pain (Watkins et al., 2006). Other studies have not found gender differences in medical consultation for pain. In a different Scottish sample, Elliott, Smith, and Hannaford (2005) found no differences in the gender of CP who had consulted with a doctor in the previous year compared to all healthcare service users. No gender differences were found between Finnish visits to the doctor by people who reported pain of any type (acute, subchronic, or chronic pain; Turunen et al., 2004). The use of ambulatory healthcare by CP patients was also not affected by gender in a Swedish study (Andersson et al., 1999). Von Korff et al. (1991) found no gender differences in health care services used after controlling for pain characteristics in a US sample. In the Carey et al. (1995) study of chronic low back pain the US, gender did not distinguish consulters from non-consulters.

The effect of age on consultation for CP is similarly inconclusive. A measure of “expressed need” for CP care was found to increase with age (Elliott et al., 1999), and younger age has been associated with not consulting a doctor for pain in the US (Nguyen et al. 2005; Watkins et al., 2006). On the contrary, no effect of age on consulting was found for chronic low back pain in the US (Carey et al., 1995) or for knee pain in older adults in the UK (Jordan et al., 2006).

The influence of an individual’s social class on non-consultation has been explored through associations with income, education, and composite measures of socioeconomic status. In a random sample of community-dwelling people with CP in the US, Nguyen and colleagues (2005) observed that lacking a high school diploma, reporting that financial concerns have affected treatment for pain, and having income below \$25,000 decreased one’s odds of consulting with a doctor about pain. In a logistic model predicting physician visits among those with CP, Andersson and colleagues (1999) found higher socioeconomic status significantly increased the odds of consulting, despite the fact that the cost of a primary care visit in Sweden, where this survey was conducted, was reported as approximately £10 (\$16 in 1999 dollars). This is consistent with findings on consultation for symptoms in general, which is more likely for people with higher incomes (Verbrugge & Ascione, 1987).

#### *Individual Level, Personality and Beliefs*

Both personality and beliefs about pain or health care are plausible predictors of medical consultation, but the existing literature has not explored these aspects of non-consultation. Some research has considered the role of mental health in consultation for CP. Andersson et al. (1999) report that people with more depressive symptoms are more likely to consult than those with fewer depressive symptoms. In contrast, Elliott et al. (2005) find no difference in their measure

of emotional health between consulters and non-consulters. On measures of ambulatory care use in general, not only consulting, Von Korff et al. (1991) report that psychological distress did not affect number of visits to the doctor for CP.

#### *Social Level, Social Support*

Marital status has been explored in relation to CP consultation, likely based on the finding that social support increases the likelihood of seeking medical care in general (Verbrugge & Ascione, 1987). Jordan et al. (2006) found a marginally significant and positive relationship between cohabiting (i.e. partnered or married) and consulting a doctor for severe knee pain. In the US, Nguyen and colleagues (2005) found that being single decreased one's odds of consulting with a doctor about pain. No other measures of social support or social integration have been investigated.

#### *Structural Level, Access to Health Care*

Measures of access to health care, including having health insurance, are largely neglected in the current literature, despite the fact that lack of health insurance is associated with lower levels of medical consultation in general (Andrulis, 1998; Davis & Rowland, 1983). This is likely because most population-based research on CP has been conducted in Europe and Canada, where nationalized health services ensure low to moderately priced health care for all citizens. Some evidence of the impact of health insurance on consulting behavior is available from the United States. Nguyen and colleagues (2005) found that lacking health insurance decreased one's odds of consulting with a doctor about pain. Refuting this is another study in of CP in the general U.S. population that found no differences in insurance status of consulters and non-consulters who reported chronic low back pain (Carey et al., 1995). The role of health insurance in consultation for CP is especially understudied in the United States, where over 50

million people are not covered by health insurance (US Census Bureau, 2010). The two remaining U.S. studies of general CP (Von Korff et al., 1991; Watkins et al., 2006) drew their samples from health care systems rather than random samples of the general population, likely biasing their findings toward those with health insurance and those who are in contact with a healthcare provider.

### **Research Questions**

Effective treatment of CP at a population level requires an understanding of people with CP who do not present for medical treatment, both who they are and how they differ from much-studied group of people with CP who are receiving treatment. Studies of consultation for CP have not converged around what influence one's likelihood of presenting to primary care for pain at any of the levels – individual, social, and structural – that are used here to conceptualize consulting behavior. Moreover, a national study of CP consulting has not been conducted in the United States. Because access to medical care is hypothesized to predict consulting behavior, the large number of people in the United States who lack health insurance limits the generalizability of European and Canadian research to the American context because of the presence of national health services in those places.

The analysis that follows has two objectives. First, I will describe the non-consulting CP population as compared to consulting population. This is useful because existing descriptions of CP non-consulters in the United States do not agree about how this group differs from consulters. Second, I will create a model of non-consultation that explores the relative impact of disease (pain) characteristics, social position, social support, and structural conditions on the likelihood of non-consultation. The predictors of interest, described below, will explore the independent contributions that pain characteristics (level of interference, number of pain sites, self-rated



health), social position (age, gender, education), personality characteristics (health locus of control, neuroticism), social resources (marital status, having children, social support), and access to health care (health insurance status) have on consultation status. These predictors are drawn from previous research and from the provisional theoretical perspective on medical services utilization and CP discussed above.

## **Methods**

### *Data*

This research will use the Midlife Development of the United States II Survey (MIDUS II, 2004-2006; Ryff et al., 2007) to understand the phenomenon of CP non-consultation in a national sample of community-dwelling middle-aged and older adults. The MIDUS II is a survey of nearly 5,000 persons aged 30 to 86 years. (The MIDUS II was a follow-up of respondents to the 1995-1996 wave of the survey, the MIDUS I.) All participants were noninstitutionalized, civilian, English-speaking persons living in the continental United States. Respondents completed a 45-minute phone interview and an extensive questionnaire booklet spanning the areas of psychosocial characteristics and resources, socioeconomic status, and health.

The present study will utilize the main sample of the MIDUS II (n=2257) that was reached through random digit dialing. The survey respondents very closely approximate the general population. All analyses were performed with unweighted data because, although frequency weights are provided, weighting the data is inappropriate because the sub-sample of interest is all people who report CP. Following Kessler and colleagues' (2001) evaluation of this dataset, no analytical compensation is being made for the minimal design effects related to the sampling procedures of the survey.

The MIDUS II provides an opportunity to study the characteristics of all people who report CP, whether or not they are in treatment or affiliated with a primary care or health insurance entity. The series of questions on CP are basic but sufficient for the research question. The MIDUS II also gathers information on psychological and social well-being of people with CP, which are hypothesized to be important to consultation for CP, as well as meaningful outcomes on their own.

### *Measures*

#### ***Consultation for CP***

##### **#Consultation Status**

The indicator of consultation status is based on the question “Have you seen a physician or other health care professional about this?” Because the present research is interested in who does not consult a doctor for CP, this measure is an indicator of non-consultation; those who replied “Yes” are coded as 0 and “No” replies are coded as 1.

#### ***Individual Level, Disease Characteristics***

##### **#Chronic Pain**

The survey asked participants “Do you have chronic pain, that is do you have pain that persists beyond the time of normal healing and has lasted from anywhere from a few months to many years?” People who replied in the affirmative are considered CP sufferers and constitute the universe of this study.

##### **#Level of Interference**

Respondents with CP were then asked how much their pain interfered with general activity, mood, relations with other people, sleep, and enjoyment of life in the past week. Responses were given on a scale of 1 (Did Not Interfere) to 10 (Completely Interfered) for each

domain. Responses to all of the interference questions were right-skewed; on each of the five domains of interference, between one-third and one-half of respondents reported no interference or 1 on the scale of 1 to 10. In addition, there was high correlation between the levels of interference across domains. In order to simplify interpretation of the models and to minimize multicollinearity, the responses to the five measures were summed and divided into quartiles. Thus, three indicator variables for the first, second, and third quartiles of total pain interference are shown, with the highest quartile of total pain interference scores serving as the reference category.

#### #Number of Pain Sites

Respondents were asked to report where their “primary pain” is located. Respondents could choose as many options as they wanted from a list that included head, neck, back, shoulders, arms/hands, hips, legs/feet, knees, and other, with an option to write in the location of their pain. Reporting multiple pain sites was common, with two-thirds of respondents reporting more than one pain site. The number of sites at which a person reported pain was summed. This measure was right skewed, with most people reporting pain at only a few sites out of the nine possible. Indicator variables were created to designate if respondents were in the lower, middle, or upper third of the distribution of total pain sites. The highest third of the distribution of total pain sites is the reference category.

#### #Self-Rated Health

Self-rated physical health was asked by the question, “In general, would you say your physical health is excellent, very good, good, fair, or poor?” The responses were coded from 1 (poor) to 5 (excellent). Self-rated physical health has been found to be a significant predictor of

well-being and mortality (Idler & Benyamini, 1997). Self-rated health will be included in the block of disease characteristics in order to control for the global health status of people with CP.

### ***Individual Level, Social Position***

#### **#Age**

The age in years reported in the dataset was calculated by subtracting year of birth from survey year. Respondents in the main sample ranged from 30 to 84 years old.

#### **#Gender**

Gender was self-reported by all respondents. Male is the reference category (0); female is coded as 1.

#### **#Education**

Two indicator variables will be used to represent three levels of education. Having a high school degree or less, and having some college or an associate's degree, will be compared to reporting a four-year college degree or higher, the reference group.

### ***Individual Level, Personality and Beliefs***

#### **#Health Locus of Control (HLOC)**

Two scales measure how an individual locates the responsibility for their health, with themselves or with others (HLOC-self and HLOC-others). Four questions measured the orientation of HLOC-self. Two questions measured the orientation of HLOC-others. The mean of item responses formed the score for each measure. HLOC-others was approximately normally distributed and is entered into the statistical models in its raw form, a scale of 1 to 7. HLOC-self was left-skewed, with approximately 5% of responses located on the extreme low end of the scale. These outliers (values between 1 and 4) were bottom-coded to have the value 4; all other

values were retained, forming a scale of 4 to 7. Higher values reflect more control over one's health attributed to others (HLOC-other) and to one's self (HLOC-self).

#### #Neuroticism

Neuroticism was measured by the respondents' endorsement of how much the adjectives moody, worrying, nervous, and calm (reverse-coded) described them on a scale of "A lot" to "Not at all." The mean of the responses was calculated such that a 1 reflects low neuroticism and a 4 reflects high neuroticism. This measure is included in the block of personality factors to account for the tendency of people with high neuroticism to report more somatic complaints (Costa & McCrae, 1987).

#### ***Social Level, Social Support***

##### #Marital Status

As a measure of existing social support, marital status was dichotomized into currently married (1) and not married (0; i.e. single, widowed, divorced, never married).

##### #Children

Although previous research on medical consultation for chronic illness or pain conditions has not looked at children as a social resource, whether or not respondents report having any living children (1; reference group=0 for having no living children) will be included in the block of variables that describe social support and resources.

##### #Positive Relations with Others

A scale of positive relations with others was derived from seven questions on the characteristics and presence of close personal relationships ( $\alpha=.78$ ). The score was calculated by creating a sum of the component responses, where a higher scores on the scale of 14 to 49 reflect greater positive relations with others.

## ***Structural Level, Access to Health Care***

### **#Health Insurance Status**

Whether or not a respondent has health insurance was taken from the question, “Are you currently covered by any healthcare insurance?” Not having health insurance was the reference category, 0; having health insurance was coded as 1.

### **Analysis Plan**

Research objective 1: Compare people with CP who consult a health care provider about pain to those who do not consult.

First, I will perform statistical tests (t-tests and chi-square) for differences between the proportions or means of consulters and non-consulters for all measures listed above. This will allow me to describe how consulters and non-consulters for CP differ across pain, social, and individual characteristics.

Research objective 2: Assess predictors of consultation, controlling for the effects of all predictors simultaneously.

Second, binary logistic regression will be used to determine which hypothesized factors affect a person’s likelihood of consulting a health care provider for CP. Predictors will be tested first in blocks corresponding to the provisional model of health care consultation for CP: pain characteristics, social position, personality characteristics, social resources, and access to health care. All variables within blocks that are significant at  $p < .20$  will be included in a preliminary model, which will be further refined to create a final model.

## **Results**

### **Sample Description**

Of all people reporting CP in the MIDUS survey (n=684), 679 indicated whether or not they had seen a health care provider about their pain. These respondents are described in Table 2. People reporting CP in the MIDUS survey are mostly female (57.2%) with a mean age of 58.3 years (SD=12.58). Of people with CP who reported a consultation status, 121 (17.8%) had not consulted a health care professional about their pain condition.

### **Bivariate Results**

Comparison of those who consulted for CP and those who did not consult revealed several differences between the groups, shown in Table 3. As might be expected, non-consulters reported lower levels of interference from pain and fewer pain sites than consulters (both  $p$ 's  $<.001$ ). On average, non-consulters also assessed their own physical health as being better than consulters. The mean self-rated health score for non-consulters was 3.44, compared to 3.1 for consulters, where a 3 on the scale corresponded to "good health" and 4 corresponded to "very good health."

Non-consulters were slightly but significantly younger ( $M=56.05$  years) than people who consulted a doctor ( $M=58.76$ ;  $p=.031$ ), but gender composition and educational attainment were no different. Personality characteristics and social support measures were similar, with two exceptions. People who consulted a doctor for CP were more likely to have living children than people who did not consult (89.8% compared to 81.8%;  $p=.013$ ). Although of marginal statistical significance, there is some indication that the self-oriented health locus of control (HLOC) is higher in consulters, 6.03 compared to 5.88 for non-consulters ( $p=.06$ ). Finally, with regard to

structural determinants of health care, significantly fewer non-consulters reported having health insurance coverage at the time of the survey (82.5% compared to 90.9% for consulters;  $p=.007$ ).

Bivariate correlations between all predictors are given in Table 4. As might be expected, the number of pain sites reported is moderately correlated ( $r$ 's between .3 and .4) with interference across different domains. There is a small correlation between neuroticism and pain interference across domains ( $r$ 's .2 to .36), and between neuroticism and the interference sum ( $r=.321$ ). Positive relations with others is also moderately and positively correlated ( $r=.342$ ) with self-oriented HLOC. Overall, none of the associations between predictors are strong enough to raise concerns of multicollinearity.

## **Multivariate Results**

### *Indicator Blocks*

Five separate models (Models A through E in Table 5) were run, each representing a set of related factors likely to affect consultation for CP. Recall that the outcome of interest is non-consultation: *not* consulting a health care provider about CP. Model A included disease characteristics, including pain interference, number of pain sites, and self-rated health. The reference groups for both categorical measures were the highest level of pain interference or number of pain sites, respectively. Compared to those with the highest level of pain interference, people reporting lower levels of interference were about 2 to 3 times more likely to not consult a health care provider about CP, although only the odds ratio (OR) for the low interference group reached statistical significance at the 5% level ( $p=.004$ ). A similar increase in the likelihood of non-consultation is observed when looking at the number of pain sites reported. People who report a number of pain sites in the lower two-thirds of the distribution were about 2.3 times as likely to not consult for CP than people who reported the highest numbers of pain sites, with both



levels statistically significant (both  $p$ 's=.009). Self-rated physical health was not associated with non-consultation in this model ( $p$ =.275).

Predictors of consultation related to an individual's age, gender, and educational attainment were entered together in Model B. Age reached statistical significance at the 5% level, with older age being associated with a reduced odds of non-consultation (OR=.983;  $p$ =.031); younger people are less likely to seek a doctor's care for CP than older people. Having some college, compared to a college degree or more, decreases the likelihood of non-consultation (OR=.554;  $p$ =.027). However, there is no difference in the odds of non-consultation between those with a college degree and those with a high school degree or less ( $p$ =.422). When controlling for age and education, gender is not associated with non-consultation for CP ( $p$ =.669) in this sample.

Model C contains the measures of individual characteristics that may affect consultation for CP, including health locus of control (HLOC) and neuroticism. None of the three measures in this model reach statistical significance at the 5% level.

Three measures of social support comprise Model D. Marital status is not related to likelihood to consult for CP ( $p$ =.673), but having any living children reduces the likelihood of non-consultation (OR=.555;  $p$ =.041). Respondents with children have odds of consulting that is 1.8 times greater than the odds of respondents without children (i.e.  $1/.555$ ). The composite measure of social support (positive relations with others) is also not significantly associated with non-consultation ( $p$ =.205).

Lastly, in Model E, health insurance status is significantly predictive of consultation for CP. A respondent who reporting having health insurance is about half as likely as someone without health insurance to not consult a doctor about pain (OR=.471;  $p$ =.008). Put differently,

people with CP who do not have health insurance are 2.21 times as likely to be non-consulters as their insured counterparts (i.e. 1/.471), when no other controls are present in the model.

### *Composite Model*

All predictors that had significance of less than .20 in Models A through E were combined to create a preliminary composite model (Model F in Table 5). All levels of a categorical predictor were retained even if only one level was associated with the outcome (i.e. educational attainment). Although neuroticism and self-rated health were not associated with consultation status even at the lenient threshold of  $p < .20$ , they are retained in the composite model for theoretical reasons. Because neuroticism is associated with higher rates of somatic complaints (Costa & McCrae, 1987), this measure is included to control for the role that trait neuroticism may play in the likelihood of reporting pain complaints. Self-rated health is included to control for the perceived level of illness in general, a known predictor of health care services utilization (Andersen & Newman, 1973).

In the composite model some individual predictors have similar effects on the likelihood of non-consultation as in previous models. Pain that produces less interference and having pain at fewer sites continues to increase the odds of non-consultation for CP after the inclusion of the additional controls in this model. Having health insurance also continues to significantly predict non-consultation (OR=.361;  $p=.002$ ).

Other predictors that seemed promising in the individual models lacked statistical significance in the composite model. Age, which was associated with consultation status in Model B, was not predictive of non-consultation in Model F, although the direction and size of the coefficient is similar ( $p=.296$ ). Having some college, compared to a college degree or higher, directionally reduced one's odds of non-consultation, although the coefficient only approached

statistical significance ( $p=.089$ ). Likelihood of non-consultation for respondents having a high school education or less is no different than for those with a college degree in this model ( $p=.896$ ). Higher ratings of self-oriented health locus of control seem to decrease one's likelihood of non-consultation ( $OR=.769$ ;  $p=.071$ ), but this predictor also failed to be significant at the 5% level. The association between consultation status and having any living children ( $OR=.555$ ;  $p=.041$  in Model D) is not observed in this composite model ( $OR=.698$ ;  $p=.261$ ).

#### *Final Composite Model*

Two changes were made to the preliminary composite model to produce the final model (Model G in Table 5). First, the age, educational attainment, and having any living children were removed as predictors. Although these variables were associated with consultation status in smaller models, they failed to retain predictive value when more controls were added. Self-rated health and neuroticism were retained, despite insignificance in Model G, for the theoretical reasons described above. The coefficients and significance of the predictors that remain in Model G, the reduced composite model, are quite similar to those in the full composite model, Model F. The small difference in the log likelihood of the two models is not statistically significant (difference in LL of 6.877 compared to a  $\chi^2_{5,05}=11.070$ ;  $p=.2299$ ), indicating that the predictive power of the reduced model is the same as the more inclusive model.

The two strongest effects on consultation status are level of pain interference and having health insurance. As a final check on the adequacy of Model G, it was compared to a similar model that also included the interaction between pain interference level and health insurance status (Model H in Table 5). Both having health insurance and pain interference influence consultation, but the interaction terms could reveal whether or not the effect of insurance is the

same on higher interference versus lower inference groups. Alternately, the effect of interference might be different on the insurance versus the uninsured.

In Model H, none of the effects of the interaction terms are significant at the 5% level. The difference in the log likelihood of Model H and Model G is also not significant (difference in LL of 1.196 compared to a  $\chi^2_{3,.05}=7.815$ ;  $p=.7540$ ), further indicating that the addition of interaction terms does not change the model fit. To illustrate the meaning of this model, Figure 1 shows model-based estimates of the odds of non-consultation for someone with the lowest category of number of pain sites, mean self-rated physical health, mean HLOC, and mean neuroticism. In general, we see that non-consultation is still a relatively rare behavior, with the OR for most cases being between 0 and .5 for this hypothetical “average” case. The noteworthy divergence in the insured and uninsured group is at the lowest and low quartiles of pain interference; the odds of non-consultation for people without health insurance who have low levels of interference is nearly three times the odds for someone with health insurance.

## **Discussion**

The purpose of this research is to understand the prevalence of non-consultation among people with CP in the US, how they differ from consulters, and what factors affect non-consultation. The proportion of people with CP in this sample who do not consult a health care professional about their pain is similar to other research (Nguyen et al., 2005; Watkins et al., 2006); in the MIDUS, 17.8% of people with CP had not consulted for pain. This speaks to the extent of “silent sufferers”, to use the term coined by Watkins and colleagues, and underscores the importance of ongoing research in this population.

Existing research is unclear on the characteristics of non-consulters. Like many of the studies reviewed above, non-consulters in the MIDUS report lower levels of pain interference

and fewer pain sites than consulters. Non-consulters are also younger, have a more positive assessment of their own physical health, are more likely to have living children, and more likely to be uninsured than consulters. No gender difference was observed at the aggregate level, and the difference in ages was, despite statistical significance, quite small.

Many factors could affect a person's likelihood of consulting for CP. Beyond differences that existed in the two groups overall, the next research objective was to quantify the effect of individual factors on the likelihood of consulting. This research hypothesized that consultation for CP, like the phenomenon of pain itself, is a biopsychosocial phenomenon, one in which disease characteristics, social position, individual factors, social support, and access to health care jointly contribute to the outcome. The model of consultation used here builds on Andersen and Newman's (1973) theory of health care utilization by adding predictors suggested by a BPS approach. Results of the analysis can be interpreted on two levels.

First, from the perspective of furthering existing research in this area, these findings emphasize that health insurance is the major determinant of consultation for people with CP when controlling for pain characteristics. The influence of pain characteristics on consultation status is supported in the existing literature, but the effect of health insurance on consultation has been unclear, with conflicting findings in the two studies in the U.S. that used general (i.e. non-health care setting) populations. Nguyen and colleagues (2005) found this association in a national random sample, but did not include controls for pain characteristics. Carey and colleague's (1995) study of chronic low back pain did not see an effect of health insurance on the likelihood of consultation in their study in North Carolina. The present study should resolve this discrepancy because the dataset is a large, national, and nearly representative random sample of

the general population, and because the model includes controls for other salient factors that influence consultation.

Second, it is worth commenting on the lack of influence of psychosocial factors on likelihood to consult for CP. This particular model was constructed on the assumption that the same factors that affect the experience of pain – namely, the social and psychological in addition to somatic dimensions – were likely to affect consultation for CP. Although higher levels of neuroticism were significantly associated with a greater likelihood of non-consultation in the final model, measures of social position, personality, and social support were not significantly related to the outcome when entered in blocks (i.e. Models B through D). This suggests that consultation for CP more closely follows the generic model of medical care utilization proposed by Andersen and Newman (1973) than a model that includes psychosocial factors.

If CP is generally understood to be a BPS phenomenon (Turk & Monarch, 2002; Turk & Okifuji, 2002), how can we make sense of consulting for CP *not* being associated with BPS factors? First, it is important to remember that health care utilization is only one of many behavioral outcomes of CP. It is possible that other behavioral outcomes of CP – time off from work, days in bed, changes in activities – would be associated with the BPS predictors used in the present models. Health care consulting, relative to other behavioral outcomes of CP, arguably requires more effort and more involvement with institutions and systems (i.e. health insurance) that may affect behavior. Consequently, it is plausible that the CP experience and some of its behavioral outcomes are influenced by BPS factors, but that consulting behavior is so largely dictated by other factors and constraints that psychosocial influences do not appear to be significant.

### *Limitations*

These findings are subject to limitations. First, secondary data analysis is by its nature limited in the measures available. The outcome of consultation is based on a question about having seen a health care provider. In the context of CP, these providers may include chiropractic care and other complementary and alternative therapies. Although I have used the terms “seen a doctor” and “medical care,” the measure does not specify a type of health care professional. The consultation with a health care professional may also not have been recent. Although the respondents report current CP, there is no way to know when they consulted, or if they received or continue to receive any treatment.

Multiple measures of CP were collected in the MIDUS II, but some details remain unknown. Onset of CP is not obtained; the period of CP specified was three months or more, but the duration of the CP experience (i.e. 3 months or 3 years) may also predict likelihood of consultation (as in Von Korff et al., 1991). Interpreting the meaning of low levels of pain is also difficult. Low pain-related interference across domains could mean a minor pain condition (like minor osteoarthritis in one or two joints) or could indicate a well-managed but severe pain condition (like severe osteoarthritis in many joints). In this way, people with low levels of pain interference who report consulting doctors may have had high pain interference before treatment.

The predictors used in the analysis were felt to be the best available proxies for components of BPS theory and Andersen and Newman’s (1973) model of healthcare utilization. However, it is possible that the variables selected do not capture or quantify with sufficient detail the intended constructs. For example, Andersen and Newman’s concept of enabling factors of access to medical care is operationalized in this analysis through health insurance coverage. This treatment does not address geographic access to health care professionals, wait time, or availability of specialists and services that Andersen and Newman also discuss. Even with health

insurance coverage, factors of accessibility of services, including prohibitive co-pays or prescription drug fees, may prevent people with CP from seeking medical care. The scarcity of pain specialists and multidisciplinary pain clinics in the United States may be a factor in non-consultation. Non-consultation may be the result of people with CP assuming that a primary care doctor would not be able to treat their pain, but being unaware of other pain treatment options. These factors are not taken into account in the models presented here.

In a similar way, marital status and the presence of living children were used as a measure of social support. Respondents who are married and have living children are assumed to have more social support than those without (living) spouses or children, but this may assumption may not be correct. The final model found no association between these two measures of social support and likelihood of consulting. The lack of association may be the result of imperfect measurement of social support rather than an actual non-association.

Finally, the cross-sectional nature of data prevents making causal conclusions. It is logical to infer that not having health insurance results in non-consultation, rather than the opposite relationship. The relationship between levels of pain and neuroticism may have bidirectional causal links with consultation status. It is possible that seeing a doctor about CP could either validate the experience of people who have pain, or, alternately, place blame or pathology on a body part where none previously existed. In the case of self-rated health, seeing a doctor for CP could influence the appraisal of one's physical health. Without longitudinal data on the outcomes of CP for consulters and non-consulters, it is also not possible to conclude that consultation produces better pain or psychosocial outcomes for all individuals.

Future research on consultation for CP should continue to explore the relationship between BPS factors and the choice to consult a medical professional for CP. Alternate measures



of pain characteristics, social support, social position, or psychological factors could continue to shed light on the somatic and non-somatic factors that affect consulting. This research area would also benefit from more detailed descriptions, including qualitative research, on how people with CP make the decision to engage healthcare professionals in their pain management.

A separate but equally important question that deserves further study is the utility of healthcare utilization for people with low to moderate levels of pain. The present research makes an assumption that non-consultation for CP puts individuals at risk for worse pain and functioning because medical treatment may help ameliorate their CP. This is not proven. It is possible that consultation for many kinds of routines pain may result in unnecessary treatment that fails to improve patient symptoms or functioning. With the increasing cost of health care, and the growing burden on the health care system in the United States, empirical support for the benefit of medical treatment for CP is needed, including what types individuals and pain respond best to what types of treatments.

### **Conclusions and Significance**

Consistent with Andersen and Newman (1973), symptoms and access to medical care are the dominant predictors of consultation for CP. The extent of non-consultation in the U.S. is far from negligible, with nearly one in five people who report CP not seeking care for their condition. Much existing research on CP focuses on easily identifiable or recruited samples from pain treatment centers or doctor's offices. Care should be taken when generalizing from samples of CP patients to the wider community of people living with CP. If almost 20% of people with CP are not presenting to treatment settings, current literature on CP fails to address the situation of non-consulters.

The present research also has implications for public health policy, such as the promotion of self-care strategies for uninsured people with low to moderate CP who are the least likely to consult doctors about pain. Research on treatment outcomes for people with CP are far from conclusive. Understanding best practices for treating people with low to moderate pain can inform what appeals are made to “silent sufferers”; reducing pain is a worthy public health goal, but sending people to physicians may not be the approach that produces the best outcomes. Further research is needed on both CP treatment outcomes and the “silent sufferer” to ensure that CP is understood and effectively addressed for all people who experience ongoing pain.

## References

- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders: Text revision* (4<sup>th</sup> ed.). Washington: American Psychiatric Association.
- Andersson, G. B. J. (1999). Epidemiological features of chronic low-back pain. *Lancet*, *354*, 581-585.
- Andersson, H. I., Ejlertsson, G., Leden, I., & Rosenberg, C. (1993). Chronic pain in a geographically defined general population: Studies of differences in age, gender, social class, and pain localization. *The Clinical Journal of Pain*, *9*, 174-182.
- Andersson, H. I., Ejlertsson, G., Leden, I., & Schersten, B. (1999). Impact of chronic pain on health care seeking, self care, and medication. Results from a population-based Swedish study. *Journal of Epidemiology and Community Health*, *53*, 503-509.
- Andersson, H. I., Ejlertsson, G., Leden, I., & Scherstén, B. (1999). Impact of chronic pain on health care seeking, self care, and medication. Results from a population-based Swedish study. *Journal of Epidemiology and Community Health*, *53*, 503-509.
- Badcock, L. J., Lewis, M., Hay, E. M., & Croft, P. R. (2003). Consultation and the outcome of shoulder-neck pain: A cohort study in the population. *Journal of Rheumatology*, *30*, 2694-2699.
- Barnes, P. M., Powell-Griner, E., McFann, K., Nahin, R. L. (2004). U.S. Department of Health and Human Services DHHS Publication No. (PHS) 2004-1250, *Advance Data From Vital and Health Statistics* No. 343, May 27, 2004.
- Benjamin, S., Morris, S., McBeth, J., MacFarlane, G. J., & Silman, A. J. (2000). The association between chronic widespread pain and mental disorder: A population-based study. *Arthritis and Rheumatism*, *43*, 561-567.

- Blagojevic, M. Jinks, C., & Jordan, K. P. (2008). The influence of consulting primary care on knee pain in older people: A prospective cohort study. *Annals of Rheumatic Disease, 67*, 1702-1709.
- Blyth, F. M., March, L. M., Brnabic, A. J. M., & Cousins, M. J. (2004). Chronic pain and frequent use of health care. *Pain, 111*, 51-58.
- Carey, T.S., Evans, A. T., Hadler, N. M., Lieberman, G., Kalsbeek, W. D., McLaughlin, C., & Fryer, J. (1995). Care-seeking among individuals with chronic low back pain. *Spine, 20*, 312-317.
- Classification of Chronic Pain: Descriptions of Chronic Pain Syndromes and Definitions of Pain Terms. Second Edition. 1994. Prepared by: Task Force on Taxonomy of the International Association of the Study of Pain. Eds.: H. Merskey, N. Bogduk. Seattle, WA: IASP Press.
- Costa, P. T., & McCrae, R. R. (1987). Neuroticism, somatic complaints, and disease: Is the bark worse than the bite? *Journal of Personality, 55*, 299-316.
- Côté, P., Cassidy, J. D., Carroll, L. (2001). The treatment of neck and low back pain: Who seeks care? Who goes where? *Medical Care, 9*, 956-967.
- Crook, J., Rideout, E., & Browne, G. (1984). The prevalence of pain complaints in a general population. *Pain, 18*, 299-314.
- Dersh, J., Polatin, P. B., & Gatchel, R. J. (2002). Chronic pain and psychopathology: Research findings and theoretical considerations. *Psychosomatic Medicine, 64*, 773-786.
- Eisenberg, D. M., Davis, R. B., Ettner, S. L., Appel, S., Wilkey, S., Van Rompay, M., & Kessler, R. C. (1998). Trends in alternative medicine use in the United States, 1990-1997. *Journal of the American Medical Association, 280*, 1569-1575.

- Elliott, A. M., Smith, B. H., & Hannaford, P. C. (2005). Chronic pain and health status: How do those not using healthcare services fare? *British Journal of General Practice*, *54*, 614-616.
- Elliott, A. M., Smith, B. H., Penny, K. I., Smith, W. C., Chambers, W. A. (1999). The epidemiology of chronic pain in the community. *The Lancet*, *354*, 1248-1252.
- Ettinger, W. H., Fried, L. P., Harris, T., Shemanski, L., Schulz, R., & Robbins, J. (1994). Self-reported causes of physical disability in older people: The Cardiovascular Health Study. *Journal of the American Geriatrics Society*, *42*, 1035-1044.
- Fishbain, D., Cutler, R., Rosomoff, H., & Rosomoff, R. S. (1997). Chronic pain-associated depression: Antecedent or consequence of chronic pain? A review. *The Clinical Journal of Pain*, *13*(2), 116-137.
- Flor, H., Fydrich, T., & Turk, D. C. (1992). Efficacy of multidisciplinary pain treatment centers: A meta-analytic review. *Pain*, *49*, 221-230.
- Gagliese, L., & Melzack, R. (1997). Chronic pain in elderly people. *Pain*, *70*, 3-14.
- Gatchel, R. J., & Mayer, T. G. (2000). Occupational musculoskeletal disorders: Introduction and overview of the problem. In T. G. Mayer, R. J. Gatchel, & P. B. Polatin (Eds.), *Occupational musculoskeletal disorders: Function, outcomes, and evidence* (pp. 3-8). Philadelphia: Lippincott Williams & Wilkins.
- Gerdle, B., Björk, J., Henriksson, C., & Bengtsson, A. (2004). Prevalence of current and chronic pain and their influences upon work and healthcare-seeking: A population study. *Journal of Rheumatology*, *31*, 1399-1406.
- Haetzman, M., Elliott, A. M., Smith, B. H., Hannaford, P., & Chambers, W. A. (2003). Chronic pain and the use of conventional and alternative therapy. *Family Practice*, *20*, 147-154.

- Haetzman, M., Elliott, A. M., Smith, B. H., Hannaford, P., & Chambers, W. A. (2003). Chronic pain and the use of conventional and alternative therapy. *Family Practice, 20*, 147-154.
- Hart, L. G., Deyo, R. A., Cherkin, D. C. (1995). Physician office visits for low back pain. *Spine, 20*, 11-19.
- Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior, 38*, 21-37.
- Jordan, K., Jinks, C., & Croft, P. (2006). A prospective study of the consulting behavior of older people with knee pain. *British Journal of General Practice, 56*, 270-276.
- Keefe, F. J., Rumble, M. E., Scipio, C. D., Giordano, L. A., & Perri, L. M. (2004). Psychological aspects of persistent pain: Current state of the science. *The Journal of Pain, 5*, 195-211.
- Kerssens, J. J., Verhaak, P. F. M., Bartelds, A. I. M., Sorbi, M. J., & Bensing, J. M. (2002). Unexplained severe chronic pain in general practice. *European Journal of Pain, 6*, 203-212.
- Linton, S. J. (2000). A review of psychological risk factors in back and neck pain. *Spine, 25*, 1148-1156.
- Loeser, J. D., & Melzack, R. (1999). Pain: An overview. *Lancet, 353*, 1607-1609.
- Magni, G., Caldieron, C., Rigatti-Luchini, S., & Merskey, H. (1990). Chronic musculoskeletal pain and depressive symptoms in the general population. An analysis of the 1<sup>st</sup> National Health and Nutrition Examination Survey data. *Pain, 43*, 299-307.
- Magni, G., Moreschi, C., Rigatti-Luchini, S., & Merskey, H. (1994). Prospective study on the relationship between depressive symptoms and chronic musculoskeletal pain. *Pain, 56*, 289-297.

- McWilliams, L. A., Goodwin, R. D., & Cox, B. J. (2004). Depression and anxiety associated with three pain conditions: Results from a nationally representative sample. *Pain, 111*, 77-83.
- Melzack, R. (1999). From the gate to the neuromatrix. *Pain, 82*(Supplement 1), S121-S126.
- Melzack, R., & Wall, P. D. (1995). Pain mechanisms: A new theory. *Psychosocial Processes and Health: A Reader*, 112-131.
- Nguyen, M., Ugarte, C., Fuller, I., Haas, G., & Portenoy, R. K. (2005). Access to care for chronic pain: Racial and ethnic differences. *Journal of Pain, 6*, 301-314.
- Ohayon, M. M., & Schatzberg, A. F. (2003). Using chronic pain to predict depressive morbidity in the general population. *Archives of General Psychiatry, 60*, 39-47.
- Peters, T. J., Sanders, C., Dieppe, P., & Donovan, J. (2005). Factors associated with change in pain and disability over time: A community-based prospective observational study of hip and knee osteoarthritis. *British Journal of General Practice, 55*, 205-211.
- Praemer, A., Furnes, S., & Rice, D. P. (1992). *Musculoskeletal conditions in the United States*. American Academy of Orthopedic Surgeons: Park Ridge, IL.
- Romano, J. M., & Turner, J. A. (1985). Chronic pain and depression: Does the evidence support a relationship? *Psychological Bulletin, 97*, 18-34.
- Ryff, C., Almeida, D. M., Ayanian, J. S., Carr, D. S., Cleary, P. D., Coe, C.... Williams, D.. (2007). Midlife Development in the United States (MIDUS II), 2004-2006 [Data file and codebook]. Retrieved from <http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/4652>
- Sternbach, R. (1986). Survey of pain in the United States: The Nuprin pain report. *The Clinical Journal of Pain, 2*, 49-53.

- Turunen, J. H. O., Mantyselka, P. T., Kumpusalo, E. A., & Ahonen, R. S. (2004). How do people ease their pain? A population-based study. *Journal of Pain, 5*, 498-504.
- U.S. Census Bureau, Current Population Survey, 2010 Annual Social and Economic Supplement. Available [http://www.census.gov/hhes/www/cpstables/032010/health/h01\\_000.htm](http://www.census.gov/hhes/www/cpstables/032010/health/h01_000.htm). Accessed 25 August 2011.
- Van der Windt, Danielle. (2010). The symptom of pain in populations. In P. Croft, F. M. Blyth, & D. van der Windt (Eds.), *Chronic pain epidemiology: From aetiology to public health* (pp. 131-149). New York: Oxford University Press.
- Verbrugge, L. M., & Ascione, F. J. (1987). Exploring the iceberg: Common symptoms and how people care for them. *Medical Care, 25*, 539-569.
- Verhaak, P. F. M., Kerssens, J. J., Bensing, J. M., Sorbi, M. J., Peters, M. L., & Kruise, D. A. (2000). Medical help-seeking by different types of chronic pain patients. *Psychology and Health, 15*, 771-786.
- Verhaak, P. F. M., Kerssens, J. J., Dekker, J., Sorbi, M. J., & Bensing, J. M. (1998). Prevalence of chronic benign pain disorder among adults: A review of the literature. *Pain, 77*, 231-239.
- Von Korff, M., Wagner, E. H., Dworkin, S. F., & Saunders, K. W. (1991). Chronic pain and use of ambulatory health care. *Psychosomatic Medicine, 53*, 61-79.
- Von Korff, M., Crane, P., Lane, M., Miglioretti, D. L., Simon, G., Saunders, K., Stang, P., Brandenburg, N., & Kessler, R. (2005). Chronic spinal pain and physical-mental comorbidity in the United States: Results from the national comorbidity survey replication. *Pain, 113*, 331-339.



Watkins, E., Wollan, P. C., Melton, J., & Yawn, B. P. (2006). Silent pain sufferers. *Mayo Clinical Proceeding*, 81i(2), 167-171.

Wolfe, F., Clauw, D. J., Fitzcharles, M.-A., Goldenberg, D. L., Katz, R. S., Mease, P., ... Yunus, M. B. (2010). The American College of Rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. *Arthritis & Rheumatism*, 62, 600-610.

Zborowski, M. (1952). Cultural components in responses to pain. *Journal of Social Issues*, 8(4), 16-30.

Zborowski, M. (1969). *People in pain*. San Francisco: Jossey-Bass.

Table 1 – Summary of Existing Studies of Consultation for Chronic Pain

	Country	Sample	CP measure	Outcome Measure	Pain characteristics
Andersson, Ejlertsson, Leden, & Schersten, 1999	Sweden	Mail survey of 1806 randomly selected persons age 25-74 in two Swedish primary health care districts; 1,607 respondents	pain experienced of >3 months	having consulted with state-provided primary care physician	high pain intensity (+)
Blyth, March, Brnabic, & Cousins, 2004	Australia	Telephone survey of randomly selected individuals 16-84 years old from New South Wales; 17,543 respondents	pain experienced for 3 months or more of the previous 6 months	visits to general practitioner in last 12 months	high pain-related interference (+)
Carey et al., 1995	United States	Telephone survey of 4437 randomly selected adults 21 years and older in North Carolina; 269 qualified respondents	back pain that limited usual activities for >3 months or more than 25 episodes in past year	seeing a medical doctor or chiropractor	pain severity (+) number of days of bed rest in previous year (+)
Elliott et al., 1999	U.K. (Scotland)	Mail survey of 5036 patients, age 25 and over, registered at 29 general practices in Grampian region; 3605 respondents	pain that started more than 3 months ago	expressed level of need scale (total of four items: having sought treatment [for CP] recently, often; having taken pain medication recently, often)	--
Elliott, Smith, & Hannaford, 2005	U.K. (Scotland)	Follow-up mail survey of patients registered at 29 general practices in Grampian region; 1608 respondents	constant or intermittent pain or discomfort present for more than 3 months	having consulted with a general practitioner, hospital specialist, physical therapist or alternative therapist in the previous year	more severe/ disabling pain (+)
Jordan, Jinks, Croft, 2006	U.K. (England)	Mail survey of all adults aged 50 years and older registered at three general practices in North Staffordshire and Cheshire; 1797 respondents	report of knee pain for which respondent had not consulted primary care	after 18 months, having presented to one's doctor with a knee-related complaint, per medical records	pain severity (+) duration (+)
Nguyen, Ugarte, Fuller, Haas, & Portenoy, 2005	United States	Telephone survey of 4655 randomly selected telephone numbers within the United States; 1335 respondents	frequent or persistent pain for at least 3 consecutive months in the past year	having consulted a health care professional or primary care practitioner for pain	pain severity (+) pain interference (+)
Von Korff, Wagner, Dworkin, & Saunders, 1991	United States	Mail survey with telephone follow-up of non-responders to 1016 randomly selected adult HMO enrollees and all (242) HMO enrollees seeking treatment for TMD pain in Puget Sound; 816 and 203 respondents in the respective groups	pain problems occurring in the past six months, graded according to severity, disability, and duration to create classes of CP	having sought care from a doctor, physical therapist, chiropractor, dentist, or other health care professional for their pain in the past six months	pain persistence (+) pain severity (+)
Watkins, Wollan, Melton, & Yawn, 2006	United States	Mail survey of 5897 persons 30 yrs or older from Olmsted County, MN who had visited any medical facility in Rochester, MN in the past 3 years; 3575 respondents	pain in the past three months that had lasted more than three months	having ever discussed pain with a doctor or health care provider	pain level (+)

Table 1 (continued) – Summary of Existing Studies of Consultation for Chronic Pain

	Gender	Age	SES	Mental and Physical Health	Marital Status	Access to Health Care	Other Predictors
Andersson, Ejlertsson, Leden, & Schersten, 1999	no association	older (+)	white-collar (+)	depressive symptoms (+) having another chronic disease (+)	--	--	immigrants and people with immigrant parents (+)
Blyth, March, Brnabic, & Cousins, 2004	controlled (effect not shown)	controlled (effect not shown)	--	poor general health (+) comorbidity (+) psychological distress (+)	--	urban (+) no association (private health insurance)	
Carey et al., 1995	no association	no association	--	no association (sciatica, overall health status, age at pain onset)	--	no association (having health insurance)	no association (employment status, hospitalization for back pain)
Elliott et al., 1999	women (+)	older (+)	--	--	--	--	
Elliott, Smith, & Hannaford, 2005	no association	no association	no association (housing tenure; education)	--	no association	--	no association (employment status)
Jordan, Jinks, Croft, 2006	women (+)	older (weak +)	no association (education)	being obese (+) "frequent consulter" (+) no association (anxiety, depression)	cohabiting (+)	--	
Nguyen, Ugarte, Fuller, Haas, & Portenoy, 2005	women (+)	older (+)	Income 25K to 75K (+) Having "some college" (+) Lacking a HS diploma (-) Income <25K (-)	--	divorced/widowed/separated (+) single (-)	having health insurance (+)	being unemployed (-) speaking English at home (+) African American (+) White (+) Hispanic (-)
Von Korff, Wagner, Dworkin, & Saunders, 1991	no association	older (weak +)	--	no association (psychological distress)	--	--	
Watkins, Wollan, Melton, & Yawn, 2006	women (+)	younger (-)	no association (education)	--	--	--	no association (employment status)

Table 2 – Sample Description

	All Respondents with CP (n=684)	
	Mean or %	SD
<b>Disease Characteristics</b>		
Interference Class		
Lowest Interference	24.50%	
Low Interference	24.10%	
High Interference	25.30%	
Highest Interference	26.20%	
Pain Site Class		
Low Pain Sites	33.30%	
Medium Pain Sites	38.50%	
High Pain Sites	28.20%	
Self-Rated Health	3.1523	1.06129
<b>Social Position</b>		
Age	58.33	12.576
Gender		
Female	57.2%	
Education		
High School or Less	39.2%	
Some College	31.0%	
College Degree or More	29.8%	
<b>Personality Characteristics</b>		
Health Locus of Control - Self	5.9993	.80653
Health Locus of Control - Other	3.4527	1.38081
Neuroticism	2.2127	.65231
<b>Social Support</b>		
Marital Status		
Married	64.4%	
Any Living Children	88.5%	
Positive Relations with Others	39.3787	7.21414
<b>Access to Health Care</b>		
Health Insurance (Has Insurance)	89.5%	

Table 3 – Comparison of Consulters and Non-Consulters

	Consultation (n=558)		No Consultation (n=121)		Sig
	Mean or %	SD	Mean or %	SD	
<b>Disease Characteristics</b>					
Interference Class					.000
Lowest Interference	23.91%		27.68%		
Low Interference	21.74%		34.82%		
High Interference	25.18%		25.89%		
Highest Interference	29.17%		11.61%		
Pain Site Class					.000
Low Pain Sites	31.18%		40.50%		
Medium Pain Sites	37.10%		46.28%		
High Pain Sites	31.72%		13.22%		
Self-Rated Health	3.0969	1.06511	3.4380	.99073	.001
<b>Social Position</b>					
Age	58.76	12.598	56.05	12.129	.031
Gender					
Female	57.0%		57.9%		.862
Education					.086
High School or Less	39.1%		40.5%		
Some College	32.4%		23.1%		
College Degree or More	28.5%		36.4%		
<b>Personality Characteristics</b>					
Health Locus of Control - Self	6.0310	.78678	5.8792	.85306	.060
Health Locus of Control - Other	3.4719	1.39043	3.2958	1.28909	.204
Neuroticism	2.1960	.64898	2.2773	.66069	.217
<b>Social Support</b>					
Marital Status					.284
Married	65.5%		60.3%		
Any Living Children	89.8%		81.8%		.013
Positive Relations with Others	39.6390	6.95096	38.4767	8.12046	.108
<b>Access to Health Care</b>					
Has Health Insurance	90.9%		82.5%		.007

Table 4 – Correlation Matrix

		No Consultation	Age	Gender	Edu - HS or less	Edu - Sm College	Edu - College+	Health Insurance
No Consultation	Pearson Correlation	1						
	<i>Sig. (2-tailed)</i>							
Age	Pearson Correlation	-0.083	1					
	<i>Sig. (2-tailed)</i>	0.031						
Gender	Pearson Correlation	0.007	0.031	1				
	<i>Sig. (2-tailed)</i>	0.862	0.415					
Edu - HS or less	Pearson Correlation	0.011	0.066	0.084	1			
	<i>Sig. (2-tailed)</i>	0.771	0.084	0.029				
Edu - Some Coll.	Pearson Correlation	-0.077	-0.019	0.05	<b>-0.538</b>	1		
	<i>Sig. (2-tailed)</i>	0.045	0.624	0.192	0			
Edu - College or more	Pearson Correlation	0.066	-0.052	-0.14	<b>-0.523</b>	<b>-0.437</b>	1	
	<i>Sig. (2-tailed)</i>	0.087	0.177	0	0	0		
Health Insurance	Pearson Correlation	-0.105	0.1	0.017	-0.014	-0.082	0.098	1
	<i>Sig. (2-tailed)</i>	0.007	0.009	0.654	0.719	0.033	0.011	
Positive Relations w/ others	Pearson Correlation	-0.062	0.117	0.095	-0.059	-0.019	0.082	0.071
	<i>Sig. (2-tailed)</i>	0.108	0.002	0.013	0.127	0.62	0.033	0.068
Married	Pearson Correlation	-0.041	-0.072	-0.202	-0.016	-0.098	0.116	0.131
	<i>Sig. (2-tailed)</i>	0.285	0.059	0	0.682	0.01	0.002	0.001
Any Children	Pearson Correlation	-0.095	0.157	0.131	0.084	-0.025	-0.064	0.061
	<i>Sig. (2-tailed)</i>	0.013	0	0.001	0.028	0.516	0.093	0.113
Self-Rated Health	Pearson Correlation	0.123	-0.109	-0.051	-0.197	-0.04	0.25	0.108
	<i>Sig. (2-tailed)</i>	0.001	0.004	0.181	0	0.301	0	0.005
HLOC - Self	Pearson Correlation	-0.073	0.072	0.114	-0.121	0.029	0.1	0.101
	<i>Sig. (2-tailed)</i>	0.06	0.061	0.003	0.002	0.456	0.009	0.009
HLOC - Others	Pearson Correlation	-0.049	0.107	0.109	0.151	0.023	-0.184	-0.091
	<i>Sig. (2-tailed)</i>	0.204	0.005	0.005	0	0.55	0	0.019
Neuroticism	Pearson Correlation	0.048	-0.192	0.149	0.105	0.014	-0.126	-0.017
	<i>Sig. (2-tailed)</i>	0.217	0	0	0.006	0.721	0.001	0.665
Interference - Lowest	Pearson Correlation	0.033	0.099	-0.07	-0.097	-0.026	0.129	0.092
	<i>Sig. (2-tailed)</i>	0.399	0.011	0.072	0.013	0.497	0.001	0.018
Interference - Low	Pearson Correlation	0.115	0.031	-0.016	-0.067	-0.004	0.076	0.067
	<i>Sig. (2-tailed)</i>	0.003	0.43	0.689	0.083	0.912	0.051	0.087
Interference - High	Pearson Correlation	0.006	-0.04	0.058	0.004	0	-0.004	-0.075
	<i>Sig. (2-tailed)</i>	0.875	0.302	0.137	0.917	0.994	0.919	0.054
Interference - Highest	Pearson Correlation	-0.15	-0.087	0.026	0.156	0.03	-0.196	-0.081
	<i>Sig. (2-tailed)</i>	0	0.025	0.495	0	0.435	0	0.037
# Pain Site - Low	Pearson Correlation	0.076	-0.147	-0.127	-0.148	0.042	0.115	0.047
	<i>Sig. (2-tailed)</i>	0.048	0	0.001	0	0.267	0.003	0.221
# Pain Site - Middle	Pearson Correlation	0.072	0.094	0.04	0.018	-0.016	-0.003	0.014
	<i>Sig. (2-tailed)</i>	0.06	0.014	0.291	0.635	0.67	0.94	0.721
# Pain Site - High	Pearson Correlation	-0.157	0.052	0.09	0.136	-0.027	-0.118	-0.064
	<i>Sig. (2-tailed)</i>	0	0.171	0.019	0	0.484	0.002	0.095

Table 4 (continued) – Correlation Matrix

		Positive Relations	Married	Any Children	Self-Rated Health	HLOC - Self	HLOC - Others	Neuroticism
No Consultation	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Age	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Gender	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Edu - HS or less	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Edu - Some Coll.	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Edu - College or more	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Health Insurance	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Positive Relations w/ others	Pearson Correlation	1						
	<i>Sig. (2-tailed)</i>							
Married	Pearson Correlation	0.222	1					
	<i>Sig. (2-tailed)</i>	0						
Any Children	Pearson Correlation	0.086	0.199	1				
	<i>Sig. (2-tailed)</i>	0.025	0					
Self-Rated Health	Pearson Correlation	0.179	0.104	-0.03	1			
	<i>Sig. (2-tailed)</i>	0	0.007	0.432				
HLOC - Self	Pearson Correlation	<b>0.342</b>	0.001	0.049	<b>0.272</b>	1		
	<i>Sig. (2-tailed)</i>	0	0.974	0.205	0			
HLOC - Others	Pearson Correlation	-0.045	-0.067	0.032	-0.106	0.031	1	
	<i>Sig. (2-tailed)</i>	0.247	0.081	0.407	0.006	0.417		
Neuroticism	Pearson Correlation	<b>-0.357</b>	-0.058	-0.004	-0.212	-0.179	0.096	1
	<i>Sig. (2-tailed)</i>	0	0.129	0.923	0	0	0.013	
Interference - Lowest	Pearson Correlation	0.162	-0.023	-0.043	<b>0.291</b>	0.12	-0.073	-0.246
	<i>Sig. (2-tailed)</i>	0	0.548	0.269	0	0.002	0.061	0
Interference - Low	Pearson Correlation	0	0.048	-0.069	0.192	0.02	-0.051	-0.014
	<i>Sig. (2-tailed)</i>	0.998	0.22	0.074	0	0.607	0.189	0.727
Interference - High	Pearson Correlation	-0.021	-0.005	0.063	-0.067	0.032	0.037	0.011
	<i>Sig. (2-tailed)</i>	0.586	0.895	0.106	0.084	0.407	0.345	0.777
Interference - Highest	Pearson Correlation	-0.138	-0.019	0.047	<b>-0.406</b>	-0.169	0.085	0.243
	<i>Sig. (2-tailed)</i>	0	0.633	0.222	0	0	0.029	0
# Pain Site - Low	Pearson Correlation	-0.004	0.028	-0.074	0.182	0.025	-0.082	-0.147
	<i>Sig. (2-tailed)</i>	0.912	0.473	0.052	0	0.515	0.033	0
# Pain Site - Middle	Pearson Correlation	0.055	0.006	-0.006	0.062	0.023	0.018	0.039
	<i>Sig. (2-tailed)</i>	0.149	0.87	0.878	0.104	0.558	0.635	0.316
# Pain Site - High	Pearson Correlation	-0.056	-0.036	0.084	<b>-0.259</b>	-0.051	0.067	0.112
	<i>Sig. (2-tailed)</i>	0.148	0.354	0.028	0	0.186	0.083	0.003

Table 4 (continued) – Correlation Matrix

		Interference - Lowest	Interference - Low	Interference - High	Interference - Highest	# Pain Site - Low	# Pain Site - Middle	# Pain Site - High
No Consultation	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Age	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Gender	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Edu - HS or less	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Edu - Some Coll.	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Edu - College or more	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Health Insurance	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Positive Relations w/ others	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Married	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Any Children	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Self-Rated Health	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
HLOC - Self	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
HLOC - Others	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Neuroticism	Pearson Correlation							
	<i>Sig. (2-tailed)</i>							
Interference - Lowest	Pearson Correlation	1						
	<i>Sig. (2-tailed)</i>							
Interference - Low	Pearson Correlation	<b>-0.321</b>	1					
	<i>Sig. (2-tailed)</i>	0						
Interference - High	Pearson Correlation	<b>-0.331</b>	<b>-0.327</b>	1				
	<i>Sig. (2-tailed)</i>	0	0					
Interference - Highest	Pearson Correlation	<b>-0.339</b>	<b>-0.335</b>	<b>-0.346</b>	1			
	<i>Sig. (2-tailed)</i>	0	0	0				
# Pain Site - Low	Pearson Correlation	0.216	0.083	-0.078	-0.215	1		
	<i>Sig. (2-tailed)</i>	0	0.033	0.045	0			
# Pain Site - Middle	Pearson Correlation	0.022	-0.042	0.121	-0.1	<b>-0.559</b>	1	
	<i>Sig. (2-tailed)</i>	0.579	0.278	0.002	0.01	0		
# Pain Site - High	Pearson Correlation	-0.249	-0.041	-0.05	<b>0.333</b>	<b>-0.443</b>	<b>-0.496</b>	1
	<i>Sig. (2-tailed)</i>	0	0.292	0.199	0	0	0	



Table 5 – Models Predicting Non-Consultation

	Disease Characteristics				Social Position				Personality Characteristics				Social Resources			
	Model A				Model B				Model C				Model D			
	Coef.	S.E.	Sig.	OR	Coef.	S.E.	Sig.	OR	Coef.	S.E.	Sig.	OR	Coef.	S.E.	Sig.	OR
Constant	-3.307	.453	.000	.037	-.327	.497	.510	.721	-.616	.893	.490	.540	-.263	.572	.646	.769
<b>Disease Characteristics</b>																
Interference																
Low est Interference	<b>.583</b>	<b>.388</b>	<b>.133</b>	<b>1.792</b>												
Low Interference	<b>1.055</b>	<b>.367</b>	<b>.004</b>	<b>2.873</b>												
High Interference	<b>.661</b>	<b>.366</b>	<b>.071</b>	<b>1.937</b>												
Pain Sites																
Low Pain Sites	<b>.873</b>	<b>.333</b>	<b>.009</b>	<b>2.393</b>												
Medium Pain Sites	<b>.839</b>	<b>.323</b>	<b>.009</b>	<b>2.313</b>												
Self-Rated Health (retained as a control)	.127	.116	.275	1.135												
<b>Social Position</b>																
Age					<b>-.018</b>	<b>.008</b>	<b>.031</b>	<b>.983</b>								
Gender					.088	.206	.669	1.092								
Education																
High School or Less					-.189	.236	.422	.827								
Some College					<b>-.591</b>	<b>.267</b>	<b>.027</b>	<b>.554</b>								
<b>Personality Characteristics</b>																
HLOC - Self									<b>-.173</b>	<b>.125</b>	<b>.164</b>	<b>.841</b>				
HLOC - Other									-.088	.076	.246	.916				
Neuroticism (retained as a control)									.188	.157	.232	1.207				
<b>Social Support</b>																
Marital Status													-.092	.219	.673	.912
Any Living Children													<b>-.590</b>	<b>.288</b>	<b>.041</b>	<b>.555</b>
Pos. Relations w ith Others													-.018	.014	.205	.982
<b>Access to Health Care</b>																
Health Insurance																
<b>Health Insurance X Pain Interference</b>																
2LL				571.782				626.544				620.452				624.223
Cox & Snell pseudo R-square				.045				.014				.008				.011
n=				663				679				667				674

Table 5 (continued) – Models Predicting Non-Consultation

	Access to Health Care				Composite Model				Reduce Composite Model				Reduced Composite Model			
	Model E				Model F				Model G (Final model)				Model H			
	Coef.	S.E.	Sig.	OR	Coef.	S.E.	Sig.	OR	Coef.	S.E.	Sig.	OR	Coef.	S.E.	Sig.	OR
Constant	-.868	.260	.001	.420	-1.181	1.224	.335	.307	-2.253	1.026	.028	.105	-2.127	1.092	.051	.119
<b>Disease Characteristics</b>																
Interference																
Low est Interference					<b>1.021</b>	<b>.422</b>	<b>.016</b>	<b>2.776</b>	<b>.971</b>	<b>.415</b>	<b>.019</b>	<b>2.640</b>	.830	.970	.393	2.293
Low Interference					<b>1.240</b>	<b>.391</b>	<b>.002</b>	<b>3.457</b>	<b>1.228</b>	<b>.384</b>	<b>.001</b>	<b>3.413</b>	1.513	.875	.084	4.538
High Interference					<b>.759</b>	<b>.385</b>	<b>.049</b>	<b>2.135</b>	.741	.382	.052	2.099	.257	.762	.736	1.293
Pain Sites																
Low Pain Sites					<b>.805</b>	<b>.353</b>	<b>.023</b>	<b>2.236</b>	<b>.880</b>	<b>.344</b>	<b>.010</b>	<b>2.411</b>	.894	.346	.010	2.446
Medium Pain Sites					<b>.785</b>	<b>.335</b>	<b>.019</b>	<b>2.191</b>	<b>.818</b>	<b>.332</b>	<b>.014</b>	<b>2.265</b>	.847	.335	.012	2.333
Self-Rated Health (retained as a control)					.207	.131	.114	1.230	.244	.125	.052	1.276	.244	.125	.051	1.277
<b>Social Position</b>																
Age					-.010	.010	.296	.990								
Gender																
Education																
High School or Less					.036	.271	.896	1.036								
Some College					-.496	.292	.089	.609								
<b>Personality Characteristics</b>																
HLOC - Self					-.263	.145	.071	.769	<b>-.293</b>	<b>.144</b>	<b>.042</b>	<b>.746</b>	-.292	.145	.045	.747
HLOC - Other																
Neuroticism (retained as a control)					<b>.428</b>	<b>.183</b>	<b>.019</b>	<b>1.533</b>	<b>.471</b>	<b>.178</b>	<b>.008</b>	<b>1.601</b>	.469	.178	.008	1.599
<b>Social Support</b>																
Marital Status																
Any Living Children					-.359	.320	.261	.698								
Pos. Relations w ith Others																
<b>Access to Health Care</b>																
Health Insurance	<b>-.752</b>	<b>.282</b>	<b>.008</b>	<b>.471</b>	<b>-1.018</b>	<b>.334</b>	<b>.002</b>	<b>.361</b>	<b>-1.018</b>	<b>.323</b>	<b>.002</b>	<b>.361</b>	-1.215	.673	.071	.297
<b>Health Insurance X Pain Interference</b>																
Low est Interference X HI													.185	1.024	.857	1.203
Low Interference X HI													-.280	.952	.768	.756
High Interference X HI													.615	.861	.475	1.849
<b>Model Fit Statistics</b>																
2LL				623.310				534.846				541.723				540.53
Cox & Snell pseudo R-square				.010				.086				.076				0.078
n=				670				647				647				647

Figure 1: Odds ratio of non-consultation by pain interference class and health insurance status for respondent with lowest category of pain sites, mean self-rated physical health, mean HLOC, and mean neuroticism.

