

PURPOSE IN LIFE AND CHRONIC PAIN: A TEST OF MEDIATING PATHWAYS

by

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(Under the Direction of Bernadette Heckman)

ABSTRACT

A strong sense of purpose in life (PIL) is considered an integral component of psychological well-being and serves as an essential resilience factor for people living with chronic pain. The utility of PIL for chronic pain patients is supported in the literature but the underlying mechanism(s) of action is not well understood. Health behavior engagement, adaptive coping strategy selection, and reduced mental health problems are suspected mediators based on the literature. The purpose of the present study was to evaluate the proposed path model linking PIL and chronic pain. Adults ($N = 104$) with chronic pain conditions completed 7 measures. The proposed model was tested employing path analysis with 2000 resample bootstrap at 95% CI's which yielded a poor structural model fit ($\chi^2 = 74.54$, $df = 11$, $\chi^2/df = 6.78$, $CFI = 0.80$, $IFI = 0.82$, $RMSEA = 0.24$, and $PClose > .001$). Model trimming was subsequently utilized for systematic removal of insignificant associations, leaving PIL, problem-focused coping, depressive symptoms, and pain interference in the final model. The final model, which displayed an good model fit ($\chi^2 = 0.31$, $df = 1$, $\chi^2/df = 0.31$, $CFI = 1$, $IFI = 1.01$, $RMSEA < 0.001$, $PClose = 0.62$.) revealed a significant positive effect of PIL on problem-focused coping ($\beta = 0.48$ [0.29 to 0.62], $p < .001$) and significant negative effect on depressive symptoms ($\beta = -0.46$ [-0.60 to -0.30], $p < .001$). Furthermore, the indirect effect of PIL on pain interference via depressive

symptoms was significant (CI = -0.38 to -0.08, $p = .002$). PIL may play an important role in limiting pain interference, perhaps by buffering depression. Such findings could have implications for the conceptualization and treatment of chronic pain sufferers.

INDEX WORDS: Purpose in Life, Chronic Pain

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DEDICATION

I dedicate this dissertation, first and foremost, to my mother and father, who devoted their lives to the well-being of my brother and me. Without your hard work, compassion, patience, and guidance, I would not be here. Thank you for making my life meaningful.

I also dedicate this work to the participants in this study and, by extension, to all those in the world who suffer physically and/or mentally. I hope you find your suffering bearable, and your life invaluable.

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CHAPTER 1

INTRODUCTION

Statement of the Problem

A strong sense of purpose in life (PIL) is considered an integral component of psychological well-being and serves as an essential resilience factor (Ryff & Singer, 1998). PIL has been conceptualized as either a component of meaning in life (MIL; Martela & Steger, 2016) or a facilitator of MIL (McKnight & Kashdan, 2009). PIL is commonly defined as a self-organizing life aim that stimulates goals, manages behavior, and provides a sense of meaning (McKnight & Kashdan, 2009). Perhaps the best argument of PIL as the predominant resilience factor was expressed by Viktor Frankl, who proposed that a sense of purpose was the determining predictor for survival within concentration camps during World War II (Frankl, 1963). While PIL is well documented as a psychological and physical need (e.g., Cohen et al., 2016), it appears to be diminished today (Roberts, 2007; Song et al., 2023).

Among the health domains associated with PIL is chronic pain, although less is known about this relationship in comparison to the relationship between PIL and other health domains (e.g., heart disease; Cohen et al., 2016; Kim et al., 2013). Chronic pain impacts an estimated 57% of Americans (Peter & Hart research Associates [HRA], 2003) in a given year with rates significantly higher for older adults, women, unemployed adults, people living in poverty, rural adults, and people with public health insurance (Dahlhamer et al., 2018). Chronic pain also contributes to an estimated \$560 billion each year in medical costs, disability programs, and diminished productivity (Dahlhamer et al., 2018). Chronic pain comes with an abundance of

physical (e.g., diabetes; Butchart et al., 2009) and psychological (Tunks et al., 2008) comorbidities. For example, as many as 50% of chronic pain sufferers experience symptoms of anxiety and depression (Banks & Kerns, 1996) and almost 20% meet criteria for substance use disorder (SUD; Polatin et al. 1993).

The contemporary literature suggests that the conceptualization and treatment of chronic pain is best understood using the biopsychosocial model (Cheatle & Gallagher, 2006). In regard to conceptualization, chronic pain patients often have diminished physical functioning and inflammation, maladaptive cognitive and behavioral coping patterns, and social barriers (e.g., insurance access, financial needs, discrimination). Similarly, treatment, utilizing appropriate biomedical intervention (e.g., non-steroidal anti-inflammatory drugs [NSAIDS]) and psychosocial intervention (e.g., psychotherapy), is most effective (Gatchel et al., 2018). Many forms of psychotherapy (e.g., cognitive behavioral therapy [CBT]) effectively address *how* a chronic pain sufferer may navigate their pain by identifying barriers, enhancing coping skills, and restructuring thought and behavioral patterns. These therapies may however lack a focus and foundation on *why* a chronic pain sufferer should engage in intervention and lifelong maintenance.

A stronger emphasis on the ‘*why*’ of cognitive and behavioral change may prove to benefit psychotherapy efficacy according to the modern motivation literature. PIL may function as a foundational precursor to goal engagement. Lewis’s (2020) PIL and motivation framework suggests that PIL may influence (1) goal selection and organization, (2) beneficial nonconscious cognitive processes, (3) self-regulation and self-control, and (4) long-term goal engagement which promotes PIL reciprocity. Moreover, the renewable cycle whereby PIL and goal

engagement impact one another predicts sustainable physical (e.g., Cohen et al., 2016) and mental health (e.g., Heisel & Flett, 2004).

The biopsychosocial benefits of having a strong sense of PIL in the general population are well-documented. PIL has been independently associated with better subjective health (Musich et al., 2018), fewer chronic illnesses (Kim et al., 2013), less dementia (Sutin et al., 2021), reduced mortality (Cohen et al., 2016; Shiba et al., 2021), and less pain (Almeida et al., 2020; Sone et al., 2008). PIL also facilitates the preventative mediators of the aforementioned health outcomes including healthcare service engagement (Musich et al., 2018), lower sleep disturbance (Kim et al., 2015), and more exercise engagement (Hooker & Masters, 2016). PIL may also reduce the presence and severity of anxiety (Boreham & Shutte, 2023; Ishida & Okada, 2006), post-traumatic stress disorder (PTSD) symptoms (Feder et al., 2013), depressive symptoms (Boreham & Shutte, 2023; Lyon & Younger, 2004), substance abuse relapse (Martin et al., 2010), and suicidal ideation (Heisel & Flett, 2004). Concurrently, PIL supports positive psychological traits like happiness (Robak & Griffin, 2000), hope (Wnuk et al., 2012), and subjective well-being (SWB; Ardel, 2008). Social support and social integration, which are important for physical and psychological well-being, are bidirectionally related to PIL (Pinquart, 2002; Zhang et al., 2019). Moreover, the presence of high PIL is protective against all-cause mortality, even in the face of significant socioeconomic barriers (Shiba et al., 2021).

PIL may be a particularly scarce yet valuable resource for the chronic pain population. People living with chronic pain have higher rates of mental disorders like depression and SUD (Banks & Kerns, 1996; Polatin et al. 1993) which have both been shown to have an inverse relationship with PIL (Lyon & Younger, 2004; Martin et al., 2010). People living with chronic pain are also less likely to have sufficient social support systems (Schleicher et al., 2005); again,

a potential cause and/or consequence of PIL (Zhang et al., 2019). PIL is a stable predictor of all-cause mortality even when socioeconomic status (SES) is taken into account (Shiba et al., 2021). People with a low-SES are far more likely to suffer with chronic pain making PIL significantly important in order to buffer the negative impact of this vulnerability (Dahlhamer et al., 2018). Taken together, it is conceivable that PIL may be a particularly valuable resource for people living with chronic pain. While the individual relationships between PIL and pain are clear, the specific mechanism(s) whereby PIL impacts pain are not well understood.

The utility of PIL for chronic pain patients is supported in the literature but the underlying reason is not well understood. Based on the literature, I propose that PIL impacts pain and pain interference directly and indirectly. Indirect effects may include change via mediation by (1) health behavior engagement, (2) adaptive coping strategy selection, and (3) reduced mental health problems (e.g., depression, substance abuse). In cross-sectional studies, people with a higher sense of PIL report better sleep, higher physical activity engagement, higher vegetable intake, and lower body mass indices (BMI; Hill et al., 2019; Hooker & Masters, 2016; Kim et al., 2015; Kim et al., 2020a). Cross-sectional and longitudinal data also suggest purpose may enhance coping self-efficacy (Stoyles et al., 2015), reduce the prevalence of negative coping strategies like catastrophizing (Almeida et al., 2020), and increase the use of positive coping strategies such as positive reframing (Malin et al., 2020). Furthermore, higher PIL is related to lower substance abuse (Kim et al., 2020b; Polatin et al. 1993) and relapse rates (Martin et al., 2010) as well as depression (Banks & Kerns, 1996).

Purpose of the Study

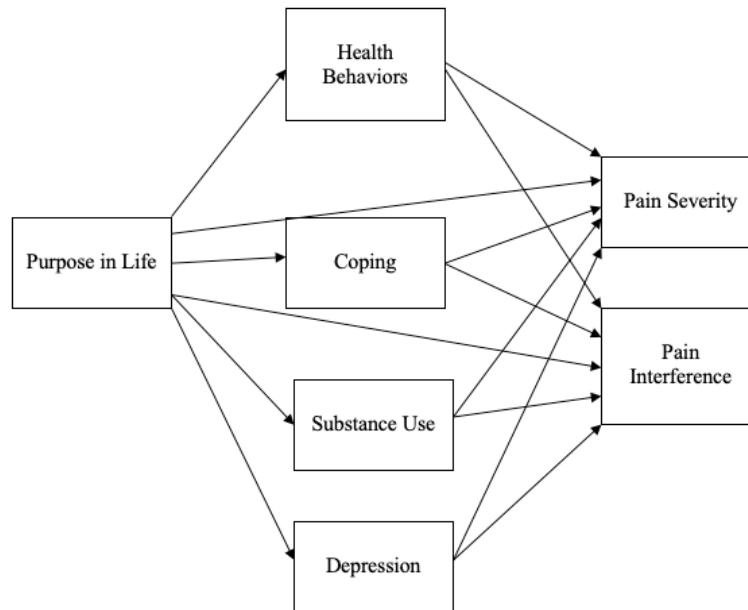
The purpose of the current investigation is to more thoroughly characterize the relationship between PIL and chronic pain. First, it is possible PIL directly affects pain directly

(Almeida et al., 2020; Smith et al., 2009). Second, PIL may decrease pain via increased engagement in health behaviors (Kim et al., 2020a). Third, pain is decreased as a consequence of adaptive coping strategies facilitated by a foundational PIL (Malin et al., 2020; Ramírez-Maestre et al., 2019). Fourth, PIL decreases common mental health problems (Boreham & Shutte, 2023; Martin et al., 2011) and therefore the burden pain causes (Bair et al., 2003). Lastly, I propose that it is plausible that one, or several of these mechanisms are responsible for the relationship between PIL and pain. A thorough model explaining the relationship between PIL and chronic pain does not exist to the author's knowledge, and therefore justifies the creation of a model that integrates the prominent mediators proposed in the literature.

PIL is a major tenant of resiliency and could serve as a fundamental underlying psychological mechanism that supports coping, physical health, and mental well-being in the chronic pain population. In order to inform current psychosocial interventions, an exploration of the paths whereby PIL may impact pain and its common correlates, is needed. The proposed theoretical model (see Figure 1) will be tested using a path analysis in order to elucidate the strength of independent associations between PIL, pain, and selected mediators.

Figure 1

The Purpose in Life Explanatory Model of Pain



Hypotheses

The major aims of the study are to examine the link between PIL and pain severity and pain interference. Based on prior research, health behavior engagement, coping, and psychological health will be statistical mediators. The utility of modeling multiple mediators will be prioritized given the abundance of work on each selected mediator. In the current study, it is hypothesized that:

1. PIL will be associated with lower pain severity.
2. PIL will be associated with lower pain interference.
3. The effect of PIL on pain severity and pain interference will occur via (a) health behavior engagement, (b) adaptive coping strategy use, and (c) lower depressive symptoms and substance abuse.

CHAPTER 2

REVIEW OF RELATED RESEARCH

Conceptualizations of Purpose in Life and the Current Shortage

Purpose in Life and Meaning in Life

Purpose in life (PIL), or, a self-organizing life aim that stimulates goals, manages behavior, and provides a sense of meaning (Mcknight & Kashdan, 2009), could be a component of meaning in life (MIL), or a distinct concept closely tied with, or predictive of, MIL. MIL has garnered significant theoretical and empirical interest due to the well-established links between the construct and psychological and physical well-being (Martela & Steger, 2016). Despite the popularity of the construct among psychological and health researchers, conceptualization of MIL is not yet agreed upon in the academic community. Martela and Steger (2015) offer a popular organizational framework which suggests that MIL is comprised of coherence, significance, and purpose. These authors suggest that coherence is a domain of *understanding* and can be described as a “sense of comprehensibility and one’s life making sense” (p. 534). Significance is a domain of *evaluation* and can be defined as a “sense of life’s inherent value and having a life worth living” (p. 534). Lastly, the focus of this study, purpose, is a domain of *motivation* and can be defined as a “sense of core goals, aims, and direction in life” (p. 534).

The previously mentioned conceptualization treats PIL as a central component of MIL. The idea that meaning arises as a result of having a clear PIL was inspired by Frankl (1963), an Austrian psychiatrist, philosopher, psychotherapist, and holocaust survivor. Frankl (1963) proposed that a foundational PIL can offset, or justify, one’s suffering and also serves as an

essential determinant of mental and physical health. Some researchers use PIL and MIL synonymously (e.g., Reker & Peacock, 1981) or treat the two as completely distinct domains (e.g., George & Park, 2013). For example, George and Park (2013) demonstrated initial psychometric evidence that MIL and PIL yield distinct predictors (e.g., religiousness predicts MIL, not PIL; optimism predicts PIL, not MIL) and argue, among others (e.g., Mcknight & Kashdan, 2013), that the two should be explicitly separated. Furthermore, PIL has also often been conceptualized as a ‘producer’, ‘component’ (Martela & Steger, 2015), or ‘source’ of MIL and its related subconstructs (i.e., significance in life). For example, Baumeister and Vohs (2002) see purpose as one of four needs of meaning. George and Park (2013) argue that having a sense of purpose will ultimately lead to a foundational significance in life (a subconstruct of MIL) and Mcknight and Kashdan see purpose as a predominant “source of meaning” (2009, p. 242). Despite competing conceptual models of MIL and PIL, most scholars agree that: (1) significance, coherence, and purpose are tightly linked; (2) PIL is related to future-oriented aims which provide directedness in life and provides context for present action; and (3) PIL is fundamentally related to motivation (Martela & Steger, 2015).

Purpose in life as a Domain of Psychological Well-Being

Psychological well-being theory (Ryff & Singer, 1989) draws from the tradition of eudaimonic well-being, which emphasizes well-being that derives from realizing one’s personal potential and meeting needs for growth. Eudaimonic well-being differs from hedonic well-being, a form of well-being that emphasizes pleasure and the reduction of pain (Martela & Sheldon, 2019). Ryff and Singer (1989) therefore view PIL more narrowly than others (e.g., Mcknight & Kashdan, 2009) as one of six interrelated domains of psychological well-being (i.e., autonomy, environmental mastery, personal growth, positive relations with others, PIL, and self-

acceptance). Ryff and Singer's (1989) theory, which integrates developmental, clinical, and humanistic literatures, suggests that "one who functions positively has goals, intentions and a sense of direction, all of which contribute to the feeling that life is meaningful," (p. 1071) which differs modestly from overarching conceptualizations of PIL that emphasize broad life aims (e.g., Mcknight & Kashdan, 2009).

One could make the argument that eudaimonic well-being, and therefore PIL, is of particular value to those living with chronic pain. Hedonic well-being places significant emphasis on reducing, or perhaps even "getting rid of" pain, and enhancing pleasure (Martela & Sheldon, 2019). Efforts to rid people of chronic pain, especially in the United States, have proven to be deadly, partially explaining the ongoing opioid crisis which led to over 30,000 deaths in 2015 (Vadivelu et al., 2018). On the contrary, efforts to live well despite pain, have proven effective for people living with chronic pain (McCracken, 1998; Schleicher et al., 2005). For example, older women with chronic pain who had higher levels of eudaimonic well-being, which encapsulates purpose, engaged in more goals when goals were autonomously motivated—a process normally inhibited for people with chronic pain (Segerstrom et al., 2022).

Evidence for the Decline of Purpose in Life

A case has been made for the decline in PIL across time, especially in the US. Even prior to the global COVID-19 pandemic, Roberts (2007) proposed that while modernity in Western civilization has helped people, there are salient declines in tradition, meaning, purpose, and existential "answers" that could help explain large scale mental health problems. While PIL data have not directly been tracked longitudinally, there is discriminant validity available that indicate a national decline. PIL protects against suicide (Heisel & Flett, 2004), and substance abuse (Kim et al., 2020b; Polatin et al. 1993), each of which has risen steadily over the last 20 years.

Moreover, lower PIL, among other psychological well-being domains (e.g., personal growth), were amongst the strongest predictors of deaths of despair in an 18-year longitudinal investigation (Song et al., 2023). Because PIL protects so many of the previously mentioned issues (e.g., suicide, health, substance abuse) it is conceivable that PIL is declining in the west and therefore unable to provide a stress buffering effect. Furthermore, purpose may be equally depleted and simultaneously necessary today in the wake of global crises such as the COVID-19 Pandemic (White, 2020).

Purpose in Life as a Foundation for Human Motivation

Due to tremendous construct overlap, it is important to disentangle purpose from goals and theories of motivation. Mcknight and Kashdan (2009) utilize Elliot's approach to defining goals: "Goals focus on a specific cognitively represented endpoint and serve to guide the individual behavior toward or away from an end point" (2006, p.113). Purpose, however, is broader and provides motivational fuel that stimulates goals and influences behavior (Mcknight & Kashdan, 2009). Purpose is also renewable and long-term compared to goals which are temporally bound (Lewis, 2020; Mcknight & Kashdan, 2009). Mcknight and Kashdan (2009) suggest that purpose can be characterized as "the supraordinate goal manager" (2009, p. 243) which produces and regulates both higher-order and lower-order goals.

As a potential motivation theory in itself (Lewis, 2020), PIL also needs to be differentiated from other theories of motivation—namely self-determination theory and terror management theory. Self-determination theory proposes that satisfying feelings of autonomy, competence, and relatedness are necessary to facilitate psychological well-being (Deci & Ryan, 2000). While striving towards autonomy, competence, and relatedness may look like purpose externally, they may not necessarily be the same if strivings do not "come from a central life

aim, become a person's identity, and manifest in a person's routine behaviors" (Mcknight & Kashdan, 2009, p. 245). Terror management theory proposes that avoidance of death anxiety is the fundamental motivational force for humans (Solomon et al., 1991). Terror management theory has been criticized for short-sightedness, discounting acceptance, and assuming continual nonconscious awareness of mortality (Mcknight & Kashdan, 2009). While central components may partially align with PIL, self-determination theory and terror management theory are better for explaining short-term predictions as opposed to a broad-scale cognitive and regulatory system across the lifespan. Furthermore, PIL is a higher-order cognitive process that requires more than primal motives which are more central to terror management theory (Mcknight & Kashdan, 2009).

Lewis (2020) offers PIL as an underlying theory of goal engagement and motivation itself. First, Lewis (2020) suggests that people select purpose-concordant goals and then devise higher-order and subgoals. Goals not aligned with one's purpose in life, which is often a reflection of values (Damon et al., 2003), will receive less effort and prompt new goal development or realignment (Lewis, 2020). Second, purpose impacts nonconscious motivational processes. Early experimental data (Burrow & Hill, 2013) suggest that PIL may direct attention towards purpose-congruent stimuli, encouraging certain behaviors (Lewis, 2020). That is, we are more prone to notice people, places, and events that are related to our PIL. Third, purpose promotes self-regulation and -control. This tenant of Lewis's (2020) theory proposes that people with higher PIL are less tempted by irrelevant, short-term, goals and rather prioritize high-order goals voluntarily and therefore preserve cognitive resources. Individuals with high PIL are also less likely to engage in impulsivity (Burrow & Spreng, 2016) and display less physiological reactivity in the face of distressing stimuli (Fogelman et al., 2015). For example, individuals

counteract tempting activities by avoiding or redirecting attention to overarching goals (Fishban & Shah, 2006). Moreover, higher purpose has been linked to executive functioning, which may be explained by enhanced self-regulation and cognitive resource efficiency (Boyle et al., 2010). Fourth, PIL and goal engagement have a reciprocal and renewable relationship. That is, PIL provides the foundation for goal engagement (Mcknight & Kashdan, 2009), and successful goal engagement raises PIL (Emmons et al., 2003).

Characterizing the Relationships Between Purpose and Selected Mediators of Pain

Purpose in Life and Health Behavior Engagement

The association between PIL and chronic illness has been demonstrated in several studies. Most broadly, a meta-analysis observing 136,265 participants revealed a significant association between high PIL and reduced all-cause mortality and cardiovascular events (Cohen et al., 2016). Similarly, in their meta-analysis establishing the link between MIL and physical health, Czekierda and colleagues (2017) found a significant link between purpose-measures and broad physical health outcomes in healthy and clinical samples. Higher purpose also predicts lower incidence of other health conditions like dementia and stroke (Kim et al., 2013; Sutin et al., 2021). Biological underpinnings are improved as a result of high PIL including lower allostatic load (Zilioli et al., 2015), less inflammation (Steptoe & Fancourt, 2019), improved glucose regulation (Hafez et al., 2018), and lower body mass indices (BMIs; Kim et al., 2020a). Underlying the relationships with biological and immune functioning may be the engagement in health behaviors (e.g., Kim et al., 2020a). Some researchers also believe that PIL could enhance other psychological and social resources which buffer against toxic stress, or, simply have a direct impact on biological pathways (Kim et al., 2019).

PIL is associated with increased physical activity. In an accelerometer study, PIL was positively associated with objectively measured movement, moderate to vigorous physical activity, and subjective activity among adults (Hooker & Masters, 2016). The relationship between PIL and physical activity has also been demonstrated longitudinally and bidirectionally (i.e., physical activity predicts PIL; Yemiscigil & Vlaev, 2021). PIL was also associated with increased physical activity during the COVID-19 Pandemic (Romero-Ramos et al., 2021). Similarly, risk of physical inactivity is lower for middle-aged and older adults who have high PIL (Kim et al., 2020a).

PIL is also positively associated with better nutrition, sleep behaviors, healthcare service utilization, and treatment engagement. Among adults, those with higher PIL with have higher rates of fruit and vegetable intake (Conner et al., 2015; Hill et al., 2019). Similarly, PIL protects sleep quantity and quality generally and enhances the odds of optimal nightly sleep length (Hamilton et al., 2007; Kim et al., 2015; Kim et al., 2020a). Furthermore, higher day-to-day variability in PIL (i.e., intraindividual variability) is associated with higher sleep disturbances among midlife and older women (Leger et al., 2021). In the Health and Retirement Study (n = 7, 168), PIL predicted a higher likelihood of obtaining preventative tests (e.g., cholesterol test, mammogram, colonoscopy, prostate exam; Kim et al., 2014). Furthermore, each unit increase in PIL was associated with 17% fewer nights in the hospital. In a sample of adults living with HIV, participants were more likely to engage in HIV-related treatment (Michlig et al., 2018).

Purpose in Life and Coping

Coping is the utilization of action-oriented and intrapsychic efforts to manage demands created by stressful events that are appraised as burdensome or exceeding personal resources (Lazarus & Folkman, 1984). Coping efforts can generally be characterized as problem-focused,

emotion-focused, or approach-/avoidant-focused and then deemed adaptive or maladaptive depending upon the context, utility, and outcome of such strategy (Lazarus & Folkman, 1984). PIL could be a coping resource, mediate between stress and physical and mental health, regulate selection of coping strategies (e.g., Malin et al., 2020), and/or even help individuals circumvent stressors all-together (i.e., proactive coping; Sougleris & Ranzijn, 2011). Behaviorally, individuals with foundational PIL may be more persistent in their efforts to solve problems and reach goals continually (approach-focused coping; Lewis, 2020; Mcknight & Kashdan, 2009). Individuals with high PIL may even be more likely to behave in ways which remove the possibility of a stressor through utilization of proactive coping (Sougleris & Ranzijn, 2011).

The literature also supports PIL as a utility for intrapsychic, or, cognitive-based coping. For example, illness-focused coping and pain catastrophizing were negatively associated with PIL in a sample of chronic pain patients (Almeida et al., 2020). Results such as these suggest PIL may act as a buffer by decreasing stress and influencing the employment of helpful problem-focused and emotion-focused coping strategies. PIL may also facilitate psychological flexibility, making individuals more adaptive in high-stress situations (Ramírez-Maestre et al., 2019). As further evidence, in a sample of adolescents struggling with adversity, PIL increased engagement of positive reframing longitudinally (Malin et al., 2020). PIL may also impact perceived stress at the perceptual level, making stressors seem relatively minimal (Stoddard et al., 2019). Experimental evidence also suggests that PIL produces a slower startle response and better cortisol regulation in the face of stressful stimuli (Fogelman & Canli, 2015; Schaefer et al., 2013).

Purpose in Life, Substance Abuse, and Mental Health

The PIL and substance abuse literature is robust across substances and populations.

For example, cocaine users relapsed less six months after rehabilitation treatment when PIL was high (Martin et al., 2011). Reliance on smoking and tobacco use is also far less common among adults with high PIL (Kim et al., 2020a). The relationship between childhood emotional neglect and substance misuse is mediated by PIL indicating a long-term protective mechanism for vulnerable individuals (Kurtuluş & Elemo, 2023). As previously discussed, the relationship between PIL and improved coping resources and abilities may mediate the relationship between PIL and substance abuse (Kim et al., 2020b). Furthermore, PIL as an overarching cognitive system, diminishes vulnerabilities of substance abuse such as impulsivity (Burrow & Spreng, 2016), temptation (Roos et al., 2005), and short-term goal prioritization (Mcknight & Kashdan, 2009).

Similar to the substance abuse literature, the relationship between PIL and mental illness and mental well-being is well-documented. In a meta-analysis involving almost 100 studies, PIL emerged as a moderately strong determinant of depression and anxiety—especially in clinical populations (Boreham & Shutte, 2023). Moreover, depressive symptoms and PIL negatively covaried overtime in a psychotherapy trial (Kim & Choi, 2021). PIL also protects against more severe mental health issues like suicidality (Heisel & Flett, 2004). Once again, the relationship between PIL and mental health is likely mediated by the tendency of people with high PIL to limit avoidance tendencies and rather orient themselves to adaptive methods of coping (Boreham & Shutte, 2023; Mcknight & Kashdan, 2009; Ryff & Singer, 1989). It is important to note that PIL not only diminishes mental illness but supports facets of mental wellness like happiness and hope (Robak & Griffin, 2000; Wnuk et al., 2012).

While PIL is related to other mental health conditions beyond that of SUD and depression (e.g., Lamis et al., 2019), these conditions will be the focus of the present investigation.

Depression is the most common comorbidity of chronic pain and has well-documented ties to pain catastrophizing and pain interference (Cheatle & Gallagher, 2006). Substance use is of particular interest to this study due to the nature of chronic pain. Over 20% of chronic pain sufferers reach criteria for SUD (Polatin et al. 1993). Furthermore, the very nature of substance abuse is inversely related to the theoretical underpinnings of this investigation and therefore a focus of this investigation. That is, substance use, in part, is an attempt to “get rid of pain”, which is closely related to hedonic well-being as opposed to PIL, a domain of eudaimonic well-being (Ryff & Singer, 1989).

Purpose in Life and Chronic Pain

There is a developing literature assessing the direct relationship between PIL and chronic pain. Cross sectional studies indicate that PIL not only decreases the amount that pain interferes in one’s life, but also overall pain severity (Almeida et al., 2020; Salt et al., 2017), possibly due to the adaptability and psychological flexibility PIL provides (Ramírez-Maestre et al., 2019). It may also be possible that higher pain severity causes lower PIL (Salt et al., 2017). Interestingly, experimental evidence suggests that individuals with higher PIL have higher pain habituation tendencies and therefore may better be able to tolerate chronic pain and perhaps display less reliance on analgesics (Kim et al., 2020b; Smith et al., 2009). Schleicher et al. (2005) conversely found that PIL is unrelated to pain, however PIL did reduce pain-related disability and fatigue in the same study.

Similar to the relationship between PIL and other constructs, multiple mechanisms may explain its association with chronic pain which provides the foundation for the present study. First, PIL could directly reduce, or be reduced by chronic pain. Second, PIL could influence health behavior engagement as well as general goal engagement which reduces pain (e.g.,

appropriate physical activity; Hooker & Masters, 2016; Kim et al., 2020a; Segerstrom et al., 2022). Third, PIL could decrease the amount of perceived stress pain causes (Stoddard et al., 2019) and influence positive coping strategy selection and therefore reduce the potential for pain to interfere in one's life (Malin et al., 2020; Ramírez-Maestre et al., 2019). Fourth, PIL diminishes the prevalence and impact of depression and SUD symptoms (Boreham et al., 2023; Kim et al., 2020b) which in turn enhances quality of life, reducing pain and pain interference (e.g., Banks & Kerns, 1996).

There is some limited evidence that PIL may actually increase pain severity (Boring et al., 2022). Purpose, which is largely influenced by the development and ongoing pursuit of goals, may be hindered by pain. In one study, coherence, not mattering or purpose, was associated with fewer and less severe pain experiences (Boring et al., 2022). In fact, a strong sense of PIL may conceivably lead to more goal creation, dissatisfaction with unmet goals, and overactivity (Hardy et al., 2011; Segerstrom et al., 2022). Furthermore, the specific source of motivation may better shed light on this relationship. For example, people oriented towards controlled sources of motivation (i.e., motivation driven by obtaining awards and avoiding punishment) as opposed to autonomous sources of motivation (i.e., driven by finding an activity meaningful, interesting, or value-congruent) may be more susceptible to higher pain severity the next day (Segerstrom et al., 2022). While these findings are important to consider, underpinnings are largely speculative. Moreover, these studies primarily investigated pain severity, not interference, which is a large focus of the present study.

Shared Correlates Between Low Purpose in Life and Chronic Pain

The present investigation is also needed because of the significant overlap in vulnerabilities faced by people living with chronic pain and people with low PIL. For example,

people are at high risk for developing chronic pain if they belong to a low-socioeconomic status (SES; Dahlhamer et al., 2018), just as individuals with low PIL are (Shiba et al., 2021). People with chronic pain are also more vulnerable to substance misuse (Turk et al., 2008) as are those who have low PIL (Kim et al., 2020b; Polatin et al. 1993), in part because of potential impulsivity, maladaptive coping patterns, and co-occurring mental health problems (Almeida et al., 2020; Boreham & Schutte, 2023; Burrow & Spreng, 2016; Feder et al., 2013). Low PIL is related to physical inactivity (Kim et al., 2020a), another shared correlate of chronic pain (Segerstrom et al., 2022). Social disengagement is also shared among these two populations (Pinquart, 2002; Saravanan et al., 2021; Schleicher et al., 2005; Zhang et al., 2019).

Purpose in Life and Psychotherapy for Chronic Pain

While the relationship between PIL and chronic pain is well-documented, the clinical research on PIL-based intervention for people living with chronic pain is limited. Meaning-centered psychotherapy (MCP) is one such intervention gaining in popularity (Breitbart, 2002; Greenstein & Breitbart, 2000). Based on the work of Viktor Frankl (1963), MCP was originally designed to specifically address the loss of spiritual well-being, meaning and purpose in life, and existential distress that often arises in people living with advanced cancer (Breitbart, 2002; Greenstein & Breitbart, 2000). Offered in group and individual formats (Breitbart & Poppito, 2014a; Breitbart & Poppito, 2014b), MCP focuses on instilling a sense of meaning and purpose in life through didactic and process exercises related to historical, experiential, creative and attitudinal sources of meaning (Breitbart & Poppito, 2014a; Breitbart & Poppito, 2014b).

MCP has now demonstrated efficacy in several randomized-controlled trials (RCTs; e.g., Breitbart et al., 2015; Breitbart et al., 2018; van der Spek et al., 2017). For example, Breitbart et al. (2015) demonstrated that patients assigned to MCP displayed significantly greater reductions

in depression, hopelessness, desire for hastened death and physical symptom distress and increases in spiritual well-being and quality of life compared to patients assigned to supportive group psychotherapy. Furthermore, MCP has been adapted and studied in several different racial/ethnic populations (e.g., Chinese immigrants; Leng et al., 2018) as well as applied to several different chronic illnesses/conditions (e.g., cardiovascular disease; Ghasemi et al., 2022). Of note, MCP performed better than cognitive-behavioral therapy (CBT) in improving meaning in life, purpose in life, and life goals (Marco et al., 2024). In the same trial, MCP performed equally as well as CBT in reducing depression and enhancing posttraumatic growth (Marco et al., 2024).

Given the unique biopsychosocial and existential challenges posed by the limitations ensued by chronic pain (e.g., Dezutter et al., 2015; Siddall et al., 2015), it is not surprising that there have been efforts to adapt MCP in this population. Winger et al. (2020, 2022) developed an intervention which infuses elements of both Pain Coping Skills Training (PCST; Keefe et al., 2005), an approach largely based in cognitive-behavioral theory, and MCP, resulting in Meaning-Centered Pain Coping Skills Training (MCPC). In a RCT pilot trial, participants completing MCPC reported reductions in pain severity and interference and increases in pain self-efficacy compared to control participants (Winger et al., 2023). While outcomes from MCPC intervention look promising, it should be noted that the intervention has primarily been tested on people living with advanced cancer-related pain which may not generalize to patients living with other types of pain conditions like musculoskeletal pain. However, promising results of MCPC could suggest “downward” generalizability to patients with chronic pain who are not approaching end-of-life.

A Unified Theory Linking Purpose in Life to Chronic Pain

A careful review of the literature reveals a significant relationship between PIL and chronic pain that has not been fully characterized to date. Upon investigating the literature, it is conceivable that PIL and pain have a direct relationship. While this relationship may be present, it does not fully explain the variance in chronic pain and pain interference. Health behavior engagement, adaptive coping strategy utilization, and psychological health (predominantly depression and SUD) are three prominent mediators that may help to more fully characterize this relationship. The relative strength of these relationships and understanding of specific intercorrelations will help to shed light on the precise mechanisms at play. Findings could help characterize pain in a way that fully informs psychosocial intervention(s) targets for people living with chronic pain.

CHAPTER 3

METHODS AND PROCEDURES

Recruitment

Upon obtaining approval from the Institutional Review Board (IRB) at the University of Georgia, a preliminary goal of 100 participants were recruited from Athens Wellness Clinic, Specialty Care Clinic, and Live Forward (see Appendix A for recruitment flyer). Participants were recruited between October 15, 2023 and October 31, 2024. Participants who elected to participate completed an electronic survey through Qualtrics. Upon completion of the survey, participants received a \$10.00 Amazon e-gift card. Participants were allowed to withdrawal from the study at any time.

Due to lower-than-expected enrollment, an IRB amendment to utilize social media and broaden inclusion criteria was created on May 23, 2024, with committee support. All people living with chronic pain in the United States were able to participate in the study as of July 25, 2024. Subsequently, an Instagram profile was created for the study and several posts were made to advertise voluntary engagement in the survey.

Participants

All study participants reviewed and signed an electronic informed consent document prior to their participation in the study. Following informed consent, participants were screened in confirm satisfaction of inclusion and exclusion criteria. To participate, participants were required to subjectively report the presence of a chronic pain diagnosis or a specific chronic pain condition (e.g., fibromyalgia). Participants also needed to be at least 18 years or older. After

successfully completing the screening process, participants were invited to complete the study's assessment.

A total of 133 participants enrolled into the study and complete the study's assessment instrument. Twelve participants were eventually excluded from analysis due to incomplete/absent pain data. An additional 17 were excluded from data analysis because they were located outside of the United States, leaving a total of 104 participants being included in the study's major data analytic efforts.

Participants identified as female (88%), male (6%), and nonbinary (6%). Participants were White (84%), Black (6%), Multiracial (5%), Asian (2%), Other (2%) and American Indian (1%). Participants achieved doctoral degrees (4%), master's degrees (23%), bachelor's degrees (40%), associate's degrees (3%), completed some college (19%), completed their GED's (2%), completed high school (6%), finished 11th grade (2%), and finished 10th grade (1%). Twenty-nine percent of participants were employed full-time, 24% were unemployed, 14% were on social security disability, and the remaining 33% were stay-at-home parents, retired, on other benefits, or declined to answer. Slightly less than half (45%) of participants had a household income of \$50,000 or more, or, did not know (16%). Participants were legally married (39%), single (39%), partnered (19%), and divorced (4%). Ages ranged from 18 to 66 ($M = 35.22$, $SD = 11.28$).

Pain conditions were diverse and included fibromyalgia (19%), complex pain due to multiple conditions (18%), pain due to a single health condition (16%; e.g., lupus, cancer, sickle cell disease, Ehlers Danlos Syndrome, degenerative disc disease, etc.), low back pain (15%), multisite pain (7%), gastrointestinal (6%), headaches (5%), single-site pain (5%), rheumatoid

arthritis (4%), full body pain (4%), and unspecified pain (2%; see Table 1 for a summary of data by pain condition).

Table 1

Means and Standard Deviations for Primary Pain Conditions

	Variable	Purpose in Life		Pain Severity		Pain Interference	
Condition	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Fibromyalgia	19	34.89	7.12	5.83	1.31	6.17	1.89
Complex Pain	17	29.76	8.47	6.47	1.29	7.27	1.61
Low Back	16	30.50	8.64	5.43	1.61	6.10	1.95

Note. *N* = Number of Participants; *M* = Mean; *SD* = Standard Deviation

Assessment Methodology

Participants choosing to take part in the study were asked to complete 7 measures on Qualtrics software, an online system where researchers can develop and distribute surveys (Qualtrics, Provo, UT). Participants were provided with contact information for study team members in the event that they had any questions or concerns regarding the study.

Measures

Demographics

Demographic characteristics were assessed, including participants' age, gender, race/ethnicity, religious orientation, SES, housing status, relationship status, education, and pain condition (see Appendix B).

Scales of Psychological Well-Being—Purpose Subscale

The 9-item Scales of Psychological Well-Being—Purpose Subscale (SPWB-PS; Ryff & Singer, 1989) asks respondents questions regarding directedness, aims and goals in life, and feelings that there is meaning to the present, past, and future. (e.g., “I have a sense of direction and purpose in life”). The SPWB used a 6-point Likert-type scale where 1 = strongly agree and 6 = strongly disagree. Possible scores on the SPWB-P range from 9-54, with higher scores indicating a stronger sense of PIL. The SPWB is widely used and has been validated in several populations continually yielding satisfactory internal consistency (Ryff & Singer, 2008). Reliability analyses indicated strong internal consistency ($\alpha = .83$).

Good Health Practices Scale

The 16-item Good Health Practices Scale (GHPS; Hampson et al., 2019 assessed engagement in common health behaviors, including physical activity (e.g., “I exercise to stay healthy”), nutrition (e.g., “I eat a balanced diet”), and sleep (e.g., “I get enough sleep”). All items used a 5-point Likert scale (1 = not at all like me—5 = very much like me). In the initial validation, 15 items were significantly related to a thorough physiological dysregulation composite (e.g., HDL cholesterol, BMI, triglycerides; Hampson et al., 2019). Possible scores range from 16-80, with higher scores indicating more engagement in day-to-day health behaviors. Reliability analyses indicated strong internal consistency ($\alpha = .66$).

Brief-COPE

The 28-item Brief-COPE (Carver, 1997) identifies an individual’s primary coping style (Dias et al., 2012; e.g., problem-focused [e.g., “I’ve been concentrating my efforts on doing something about the situation I’m in.”], emotion-focused [e.g., “I’ve been saying things to let my unpleasant feelings escape.”], or avoidant [e.g., “I’ve been turning to work or other activities to

take my mind off things.”]). Additionally, the following facets are derived from the Brief-COPE: Self-distraction, Denial, Substance Use, Behavioral Disengagement, Emotional Support, Venting, Humor, Acceptance, Self-Blame, Religion, Active Coping, Use of Instrumental Support, Positive Reframing, and Planning. Each item uses a four-point response scale (1 = I haven’t been doing this at all to 4 = I’ve been doing this a lot) In this study, total scores for primary coping styles (e.g., problem-focused, emotion-focused, and avoidant) were utilized. Possible scores range from 8-32 for the problem-focused coping subscale, 12-48 for the emotion-focused coping subscale, and 8-32 for the avoidant coping subscale. Reliability indices were strong for the problem-focused coping subscale ($\alpha = .83$), and satisfactory for the emotion-focused coping ($\alpha = .32$) and avoidant coping ($\alpha = .58$) subscales.

Patient Health Questionnaire—9

Depressive symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001). Each item used a 9-item Likert-type scale (0 = Not at all—3 = Nearly every day) to measure common symptoms of depression (e.g., “Feeling down, depressed, or hopeless”). The PHQ-9 yields an overall score that ranges from 0-27. Individuals are characterized as having minimal depressive symptoms (1-4), mild depressive symptoms (5-9), moderate depressive symptoms (10-14), moderately severe depressive symptoms (15-19), and severe depressive symptoms (20-27). A recent meta-analysis suggested the PHQ-9 is comparable in specificity to a diagnostic interview (Levis et al., 2019). It is important to note, however, that the PHQ-9 is a screening measure, and higher scores do not necessarily imply presence of a mood disorder. Reliability analyses indicated strong internal consistency ($\alpha = .87$).

Item 9 on the PHQ-9, which asked about thoughts of self-harm, is considered a critical item and was therefore evaluated each time a participant submitted a survey response.

Participants choosing an option greater than '0' were prompted with an additional question: "Based on the results to this measure, we would like to contact you to ensure your mental well-being, provide resources, and a referral if necessary. It is important to note that the co-investigator of this study is a trained, doctoral behavioral health clinician working under the supervision of a licensed psychologist. In order for the co-investigator to contact you, we kindly ask that you provide your phone number and/or email below:" All respondents indicating possible thoughts of death or self-harm ($n = 19$) were contacted within 24 hours of their survey submission and assessed for risk per IRB documentation. No participants endorsed active suicidal ideation and all participants reported that they were receiving some form of mental healthcare and requested no further resources or referrals.

The Tobacco, Alcohol, Prescription Medication, and Other Substance Use Tool

The Tobacco, Alcohol, Prescription Medication, and Other Substance Use Tool (TAPS; McNeely et al., 2016) is a 4-item brief assessment of tobacco, alcohol, prescription medication, and other drug use (e.g., In the PAST 12 MONTHS how often have you used any drugs including marijuana, cocaine or crack, heroin, methamphetamine [crystal meth], hallucinogens, ecstasy/MDMA?) over the last year. Each of the 4 items has 5 possible responses: Daily or Almost Daily, Weekly, Monthly, Less Than Monthly, or Never. The total uniform score was utilized for model simplification prior to path analysis, but yielded minimal internal consistency in the present study ($\alpha = .41$).

Brief Pain Inventory

The pain severity and pain interference subscales of the Brief Pain Inventory (BPI; Cleeland, 1991) measured chronic pain. The pain severity subscale consists of 4 items that ask participants about their pain level (0 = No pain to 10 = Pain as bad as you can imagine) at its

worst, least, average, and current state (e.g., “Please rate your pain by circling the one number that best describes your pain at its worst in the last week.”). The average of the 4 items was used as the overall pain severity composite and yielded strong internal consistency in the present study ($\alpha = .88$). Similarly, the pain interference subscale consists of 7 items (0 = Does not interfere to 10 = Completely interferes) that measure the degree to which pain interferes with general activity, mood, walking ability, normal work, relations with other people, sleep, and enjoyment of life. The average interference score served as the primary overall indicator of pain interference and yielded strong internal consistency in the present study ($\alpha = .88$).

Data Analysis Plan

IBM SPSS Statistics 29.0 and AMOS 26.0 were utilized to organize data, analyze initial descriptive statistics, and conduct a path analysis. First, data were screened to assess for missing data, outliers, normality, linearity, multicollinearity, and homoscedasticity (Tabachnick & Fidell, 2019). Based on the literature, covariances were assumed and accounted for between the three types of coping as well as the relationship between depressive symptoms and substance abuse. Furthermore, if the initial proposed model is not a good fit, model trimming will be utilized in order to obtain a statistically accurate model (Kline, 2023).

Criteria for identifying a sufficient model fit are multifaceted (Kline, 2023). In general, Root Mean Square Error of Approximation (RMSEA) was heavily weighted in the present study and a strong model fit was expected to be 0.06 or less with an insignificant PClose value (Hu & Bentler, 1999). The Comparative Fit Index (CFI) for a good model fit was also expected to be > 0.95 (Hu & Bentler, 1999).

Data were analyzed using IBM SPSS 29.0 and AMOS 26.0. Data were screened for linearity, homoscedasticity, independence of errors, normality, and independence of dependent

variables (Tabachnick & Fidell, 2019). Assumptions for path analysis were satisfied with the exception of skewness (-2.02) and kurtosis (4.02) indices for substance abuse (i.e., TAPS).

Substance abuse was retained in the initial model with the assumption that model respecification would be utilized. Sample size was acceptable based on general rules of thumb (10 times the number of parameters), however having 20 times the number of parameters would have provided more reliable outcomes. Missing data were then assessed, identifying 28 missing data points out of 936 (>3%) for variables included in path analysis. Maximum likelihood estimation was utilized for imputation prior to analyses via AMOS 26.0. Error terms were placed on all endogenous variables in the model prior to analysis in order to account for unexplained variance.

CHAPTER 4

RESULTS

Descriptive Statistics

Table 2 contains correlations among variables involved in the structural equation modeling analyses. The highest positive correlation was between pain severity and pain interference ($r = 0.77, p < .001$). The three highest correlates of purpose in life (PIL) were problem-focused coping ($r = 0.48, p < .001$), depressive symptoms ($r = -0.46, p < .001$), and health behavior ($r = 0.36, p < .001$). Health behavior was also significantly correlated with problem-focused coping ($r = 0.49, p < .001$), emotion-focused coping ($r = 0.29, p = .003$), and depressive symptoms ($r = -0.28, p = .004$). Problem-focused coping was correlated primarily with emotion-focused coping ($r = 0.55, p < .001$) and depressive symptoms ($r = -0.26, p = .007$). Avoidant coping was correlated with depressive symptoms ($r = 0.54, p < .001$) and substance abuse ($r = -0.47, p < .001$). Other notable relationships included that between pain severity and depressive symptoms ($r = 0.26, p = .008$) as well as the relationship between pain interference and depressive symptoms ($r = 0.51, p < .001$).

Table 2*Correlations Among Primary Study Variables*

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Purpose in life	33.15	8.25	-	0.36**	0.48**	0.15	-0.32**	-0.46**	0.001	-0.07	-0.27**
2. Health Behavior	62.92	7.14	0.36**	-	0.49**	0.29**	-0.20*	-0.28**	0.10	-0.13	-0.25**
3. PF coping	2.70	0.59	0.48**	0.49**	-	0.55**	-0.03	-0.26**	-0.05	0.07	-0.14
4. EF coping	2.65	0.35	0.15	0.29**	0.55**	-	0.17	0.12	-0.15	0.10	-0.01
5. Avoidant coping	1.97	0.43	-0.32**	-0.20*	-0.03	0.17	-	0.54**	-0.47**	0.12	-0.28**
6. Depressive Sx	11.20	5.91	-0.46**	-0.28**	-0.26**	0.12	0.54**	-	-0.30**	0.26**	0.51**
7. Substance abuse	18.84	2.09	0.001	0.10	-0.05	-0.15	-0.47**	-0.30**	-	0.10	0.02
8. Pain severity	5.63	1.56	-0.07	-0.13	0.07	0.10	0.12	0.26**	0.10	-	0.77**
9. Pain interference	6.12	1.99	-0.27**	-0.25**	-0.14	-0.01	-0.28**	0.51**	0.02	0.77**	-

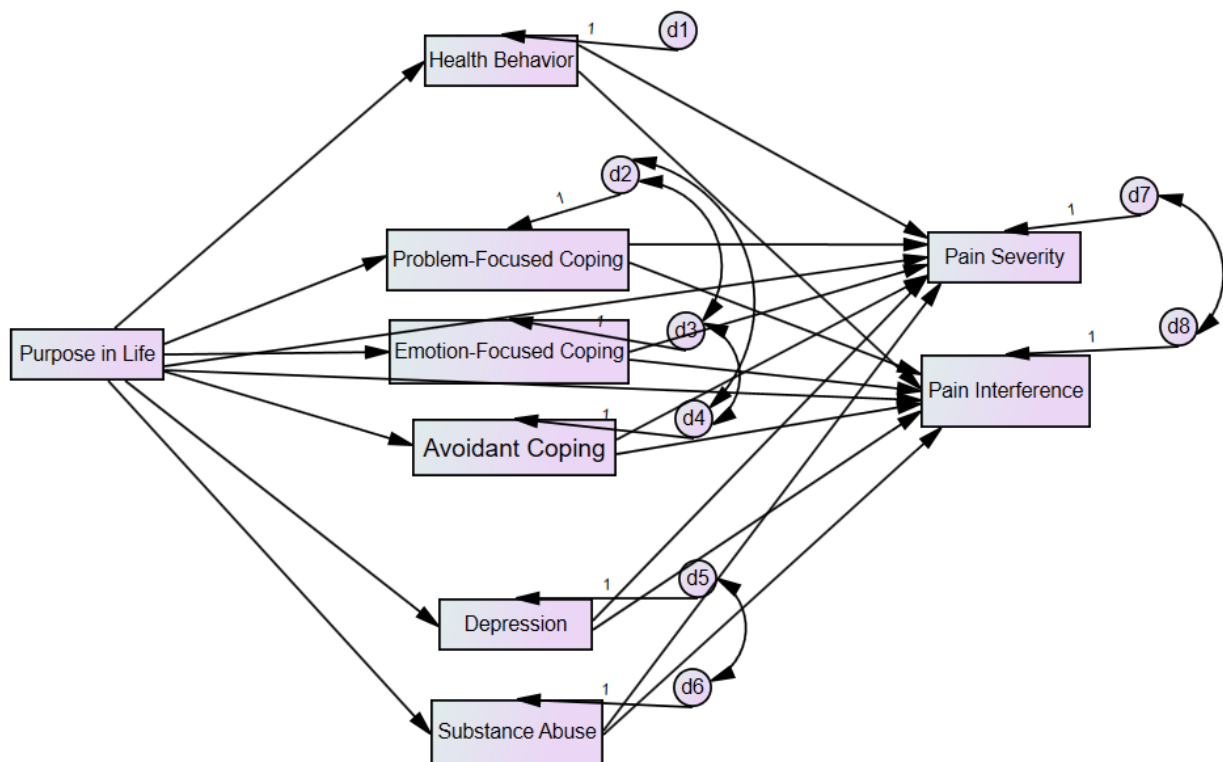
Note. PF = Problem-focused; EF = Emotion-focused; Sx = Symptoms; *M* = Mean; *SD* = Standard Deviation; ** Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level

Path Analysis Results

The proposed model (see Figure 2) was tested using path analysis in AMOS 26.0 employing 2000 resample bootstrap at 95% CI's. The analysis showed a poor structural model fit $\chi^2 = 74.54$, $df = 11$, $\chi^2/df = 6.78$, CFI = 0.80, IFI = 0.82, RMSEA = 0.24, and PClose > .001.

Figure 2

Proposed Model Linking Purpose in Life to Pain



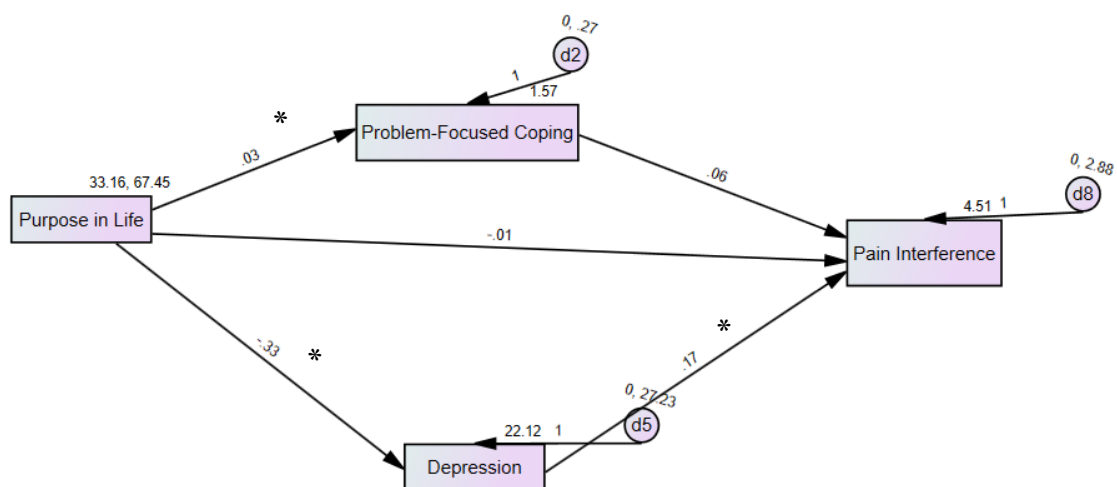
Model trimming was subsequently employed to systematically remove associations that were not significant in the initial model (Kline, 2023). Only problem-focused coping ($\beta = 0.24$ [0.03 to 0.45], $p = .03$) and depressive symptoms ($\beta = 0.35$ [0.13 to 0.57], $p = .003$) were associated with pain severity in the first model. Consistent with the literature, pain interference was more strongly associated with psychosocial variables and therefore pain severity was

trimmed from the model. Only two paths in the initial model justified retention in a final model: The path by which (1) PIL “impacts” depressive symptoms ($\beta = -0.46$ [-0.60 to -0.30], $p < .001$) which could potentially impact pain interference, and the path by which (2) PIL impacts problem-focused coping ($\beta = 0.48$ [0.30 to 0.62], $p < .001$) which could potentially impact pain interference.

The final model (see Figure 3), which displayed an good model fit, included PIL, problem-focused coping, depressive symptoms, and pain interference $\chi^2 = 0.31$, $df = 1$, $\chi^2/df = 0.31$, CFI = 1, IFI = 1.01, RMSEA < 0.001, and PClose = 0.62. The standardized regression weights revealed a significant positive effect of PIL on problem-focused coping ($\beta = 0.48$ [0.29 to 0.62], $p < .001$) and significant negative effects on depressive symptoms ($\beta = -0.46$ [-0.60 to -0.30], $p < .001$). Furthermore, there was a significant relationship between depressive symptoms and pain interference ($\beta = 0.49$ [0.31 to 0.65], $p = .002$). The squared multiple correlations indicated that the model explained 23% of the variance in problem-focused coping, 21% in depressive symptoms, and 27% in pain interference. The indirect effect of PIL on pain interference via depressive symptoms was also significant (CI = -0.38 to -0.08, $p = .002$).

Figure 3

Trimmed Model Linking Purpose in Life to Pain Interference



Note. * = significant path at the $p < .05$ level.

CHAPTER 5

SUMMARY CONCLUSIONS AND IMPLICATIONS

Summary of Findings

Overall, there was no support for the first hypothesis (i.e., purpose in life [PIL] will be associated with lower pain severity) or second hypothesis (i.e., PIL will be associated with lower pain interference). There was, however, some support for the third hypothesis (i.e., PIL indirectly predicted lower pain interference via lower depressive symptoms). The initial proposed path model linking purpose in life (PIL) to health behavior, coping (i.e., emotion-focused, problem-focused, and avoidant), depressive symptoms, substance abuse, and pain severity and interference as dependents, yielded a poor model fit, untenable for post-hoc analyses. Subsequent modeling was conducted and a significant model including PIL, problem-focused coping, depressive symptoms, and pain interference, produced a good overall fit. PIL predicted higher problem-focused coping and lower depressive symptoms. Furthermore, depressive symptoms predicted higher pain interference scores. There was an indirect effect of PIL on pain interference via depressive symptoms, in line with the literature. Results support the notion that PIL tends to influence adaptive coping strategies and reduce depressive symptoms significantly. The impact that PIL has on depressive symptoms may be substantial enough to limit pain interference in people living with chronic pain.

Consistent with the literature, PIL was related to health behavior engagement in the present study. While this relationship was significant, health behavior was unrelated to both pain and pain interference. Previous findings have indicated that PIL may bolster medical adherence

(Kim et al., 2014; Michlig et al., 2018), physical activity (Hooker & Masters, 2016), sleep (Hamilton et al., 2007; Kim et al., 2015; Kim et al., 2020a), and fruit and vegetable intake (Conner et al., 2015; Hill et al., 2019), while lowering systemic inflammation (Steptoe & Fancourt, 2019) and all-cause mortality (Cohen et al., 2016). Certain byproducts of high PIL (e.g., better sleep, lower systemic inflammation, adequate physical activity), could plausibly contribute to reductions in pain severity and interference via more musculoskeletal recovery, increased flexibility and mobility, and less inflammation (Baeske et al., 2024; Goossens et al., 2024). In the current study, PIL may have enhanced health behavior engagement, but not in such a way that there were substantial consequences on pain severity or interference. While PIL may not enhance health behavior engagement in a way that effects pain, it may unitarily impact health in the chronic pain population.

In the present study, PIL predicted higher problem-focused coping and lower avoidant coping. Individuals with higher PIL may be more persistent in their efforts to solve problems and reach goals continually via problem-focused coping (Lewis, 2020; Mcknight & Kashdan, 2009). Given the relationship between PIL and problem-focused coping (e.g., Lewis, 2020), and the documented relationship between problem-focused coping and pain (Alok et al., 2014), one would have expected there to be such a relationship in the present study. Problem-focused coping remained significant in the secondary path model developed in this study, but again was only predicted by PIL independently and had no bearing on pain. In the first model, PIL was also negatively associated with avoidant coping as expected. It may be possible that adaptive coping strategies, such as problem-focused coping, are preferred by individuals with a strong sense of PIL. While this finding is consistent, the data do not suggest a cumulative effect on pain interference. Interestingly, in the first (non-significant) model, problem-focused coping was

associated with both pain severity and interference. The utility of this coping style for people with pain should be of particular interest to researchers even if such coping mechanisms do not effect pain.

Depressive symptoms proved to be a key variable in the final analysis displaying direct associations with pain interference (see Table 3 for a summary of data by depression category). First, PIL was associated with lower depressive symptoms in line with previous research (Boreham & Shutte, 2023; Heisel & Flett, 2004; Kim & Choi, 2021). Second, depressive symptoms remained the only stable predictor of pain interference in the final model. Third, the indirect effect of PIL on pain interference through lowered depressive symptoms was significant. It was expected that people with lower depressive symptoms also experienced less pain interference. For example, in one study, there was a strong direct relationship between major depression and pain interference but not pain intensity (Li et al. 2022). The mediating effect of depressive symptoms was unique and has not frequently been explored often in the pain literature. Similar to the present study, Nsamenang et al. (2016) found that meaning, a related construct of PIL, was related pain interference via depression.

Table 3*Means and Standard Deviations by Depression Category*

Dep. Category	Variable	Purpose in Life		Pain Severity		Pain Interference		GHPS		Avoidant Coping		PF Coping	
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Minimal	11	39.92	10.36	5.19	1.96	4.68	2.40	68	5.76	1.57	0.24	3.00	0.78
Mild	40	35.30	6.50	5.46	1.55	4.48	1.82	63.55	7.22	1.83	0.33	2.75	0.62
Moderate	24	32.08	7.66	5.39	1.40	6.03	1.55	63.04	6.46	1.99	0.31	2.77	0.47
Moderately Severe	15	30.40	7.84	6.27	1.16	7.34	1.33	59.93	5.98	2.28	0.50	2.54	0.30
Severe	14	26.50	6.98	6.23	1.69	7.94	1.57	60.14	8.22	2.35	0.49	2.36	0.65

Note. Dep. = Depression; PF = Problem-focused; GHPS = Good Health Practices Scale; *N* = Number of Participants; *M* = Mean; *SD* = Standard Deviation

There was no direct relationship between PIL and pain interference in this study, when controlling for other variables in the model. While few studies have explored this direct relationship, PIL and pain interference have common correlates, such as depression, and therefore a direct relationship was suspected. Based on results, it may be possible that PIL supports health behavior engagement, adaptive coping utilization, and mood, but not in a way that reduces the burden of pain. Despite this possibility, PIL could still be a foundational resource for this population. While serious pain may interfere greatly in life regardless of PIL, individuals with higher levels of PIL may fair better in life outside of pain. Given the focus of many contemporary interventions for pain (e.g., acceptance and commitment therapy [Hayes & Pierson, 2005])), perhaps enhancing quality of life despite pain interference is supported by the current study. For example, an individual with high levels of PIL and pain interference, may enjoy volunteering in their local community. While their pain interference may remain high and greatly limit their volunteering, the little engagement they do have may be more valuable and pursued via high PIL. Similarly, the individual's health behavior engagement, coping, and mood may be enhanced, further enhancing well-being outside of pain.

It is equally important to speculate that a direct relationship between PIL and pain may not exist, or perhaps there is an inverse relationship present. Despite underlying assumptions that PIL is inherently “good”, some research suggests strong associations between acclaim seeking, a subconstruct of narcissism, and PIL (Velji & Schermer, 2024). This phenomenon may be best illustrated by the Icarus Complex, a personality pattern characterized by grandiosity, overambition, and a consistent need to defy limitations, which may be particularly detrimental to chronic pain (Murray 1955/1981). Boring et al. (2022) found that coherence, not other subconstructs of meaning like purpose and mattering, was related to less frequent and severe

pain. One could speculate that people with higher PIL are more negatively impacted by pain, which often causes goal conflict (Boring et al., 2022). PIL could also encourage one to create more goals which in turn are unmet due to limitations caused by pain (Segerstrom et al., 2022). Lastly, overactivity and thus pain severity may be more common in people with higher levels of PIL who are often persistent in goal efforts (Hardy et al., 2011; Segerstrom et al., 2022).

Limitations

While results of this study may inform interventions for people living with chronic pain, there are several limitations which need to be noted. First, this study was cross sectional and data were predominantly gathered by the convenience of advertising on social media. The investigation was largely exploratory, and therefore a cross sectional design was useful in creating a justification for future studies. Longitudinal and experimental designs will be needed to justify any causal claims. More advanced research designs will also enable opportunities to explore bidirectionality and intraindividual change, which is of growing interest in the health psychology literature.

Second, chronic pain was defined broadly, and therefore the sample was comprised of individuals with varying pain condition (e.g., fibromyalgia, pain caused by multiple chronic health conditions, low-back pain, etc.). While this limitation is necessary to mention, it is also likely the case that the relationship between many psychosocial variables (e.g., PIL) and pain is unaffected by the cause of pain. For example, the relationship between PIL and pain has been documented in several different populations without any obvious between-condition variability (Almeida et al., 2020; Salt et al., 2017; Schleicher et al., 2005). While pain conditions may require differing physical conceptualizations and treatments, the psychological properties of pain are less evident from one condition to the next.

Third, measures in this study were intentionally brief in order to keep participation rates high which may have compromised internal validity. For example, the TAPS measure (McNeely et al., 2016) is very brief, and developing a unitary variable led to high skewness and kurtosis ultimately making the variable unusable in the analysis. More comprehensive measures of substance abuse may be useful in future studies especially given higher pain scores observed in the present study.

Fourth, the sample was predominately comprised of highly-educated, young, unemployed, white, adult women with chronic pain conditions. Women experience pain more frequently and therefore the study of this population is important, however, results may not externalize to racial and ethnic minorities, older adults, and those with less education. For example, a growing literature suggested that Black Americans have higher rates of chronic pain in comparison to White Americans (Dahlhamer et al., 2018) which is exacerbated by discrimination and provider biases in both diagnosis and treatment delivery (Booker et al., 2022; Hoffman et al., 2016). The unique role PIL plays in chronic pain could differ in a sample with higher demographic heterogeneity and therefore should be considered for future investigations. Simultaneously, this study offers insight into the pain experience of young women experiencing pain, a group often overlooked in favor of older adults who experience chronic pain at higher rates.

Fifth, it is important to note that the organization of the present model, while backed by cross-sectional and longitudinal data, is only one explanation of an explanatory path model. It is also possible that the PIL-depression-pain relationship occurs in the reverse direction (i.e., pain increases depressive symptoms and therefore reduces PIL). Moreover, it is possible that there is a bidirectional relationship between pain and depressive symptoms which has been demonstrated

previously in longitudinal studies (Werneck & Stubbs, 2024). Future longitudinal studies examining the relationship between PIL, depression, and pain will provide a more thorough picture of underlying path directions and mechanisms of action.

Lastly, the sample size in the present study was sufficient, but not ideal. Given the largely exploratory nature of this study, lower statistical power may have inhibited the possibility of a finding significance in the initial model. Furthermore, higher statistical power could have allowed for the observation of more statistically significant paths. Future studies with similar designs may benefit from having sample sizes of at least 20 participants per parameter (Kline, 2023),

Conclusions

PIL is an important factor for people living with chronic pain. While the present study suggested a lack of support for the initial proposed model, a follow-up analysis representing a simplified model provided a good fit which explained the relationship between PIL and pain interference using two mediators. Overall, results suggest that (1) PIL enhances the utilization of adaptive coping strategies, (2) the presence of depressive symptoms greatly increases pain interference, and (3) PIL impacts pain interference by buffering depressive symptoms.

Depression is common among people living with chronic pain. Despite this well-documented path, further emphasis on should be placed on treating depression in patients suffering from functional and quality of life impacts caused by pain. Furthermore, the utility of PIL as a catalyst for coping enhancement is important. Pain limits psychological resources which is often a target for mental health professionals. Understanding this potential foundational source of coping (PIL) is thus important for informing psychosocial intervention. Lastly, PIL may have a larger impact on depressive symptoms than previously displayed in the chronic pain research. In the present

study, PIL may have buffered depressive symptoms intensely enough to explain reductions in pain interference.

Implications

PIL may be an important protective factor for people living with chronic pain and should therefore be attended to in treatment. First, it may be important that existing psychosocial interventions be adapted in order to address issues of meaning and purpose. Winger et al. (2020, 2022) provides a good example of this recommendation through Meaning-Centered Pain Coping Skills Training (MCPC). Like many psychotherapies for chronic pain, cognitive-behavioral strategies are addressed in addition to addressing concerns of meaning and purpose. As proposed in the justification for the present investigation, many contemporary treatments for pain address strategies for pain management, but often lack an emphasis on existential-motivational factors.

Second, this study adds to a growing literature and therefore can support the development of independent interventions which focus on issues of meaning and purpose. Results suggested that PIL is associated with adaptive coping strategies, health behavior engagement, and most notably, lower depressive symptoms. The impact of PIL on depressive symptoms may be substantial enough to reduce pain interference and therefore may be foundational for pain psychotherapy.

Third and most broadly, this study provides a valuable addition to the theoretical pain literature. PIL appeared to have associations with health behavior engagement, adaptive coping mechanisms, and depressive symptoms but not in a way that impacted pain. These impacts may be important, specifically for people living with pain even if those impacts do not affect pain which could provide an updated acceptance-based framework for pain treatment goals. Perhaps the goal of treating pain is not purely to reduce pain or even pain interference—rather, the goal

of treatment could conceivably be to enhance one's life despite continued limitations caused by pain. The way in which one's life may be enhanced, at least with respect to the current results, is through bolstering PIL.

Future Directions

This study points to several directions for future research. First, the observed indirect relationship between PIL, depressive symptoms, and pain interference in this study is important. Researchers should aim to replicate findings and potentially re-examine the otherwise insignificant pathways in this study. Second, future research should account for potential bidirectional relationships. As previously suggested, it is possible that pain impacts PIL (e.g., Salt et al., 2017) which differs from the directional assumptions in this investigation. Third, it remains unclear whether or not PIL impacts pain severity positively, negatively, or not at all (e.g., Boring et al., 2022). As hypothesized in this study, PIL could be a protective factor for people living with chronic pain. Contrarily, PIL could motivate overactivity, increase the number of goals one sets, and therefore cause distress and higher pain. Fourth, longitudinal investigations should be utilized to further characterize the relationships between PIL, the selected mediators, and pain. Longitudinal studies not only account for change over time, but also allows for an investigation of PIL and pain fluctuations through examining intra-individual changes (e.g., Leger et al., 2021).

The present study also encourages the creation of PIL-focused intervention as well as the continued development of existing interventions. PIL may be associated with reductions in depressive symptoms to the point of reducing pain interference. This finding particularly supports underpinnings of Meaning-Centered Pain Coping Skills Training (MCPCST; Winger et al., 2022, 2023) which combines elements of popular cognitive-behavioral methods with the

tenants of Meaning-Centered Psychotherapy (MCP; Breitbart, 2002; Greenstein & Breitbart, 2000). This intervention is of particular interest in the current study because it addresses interventions which attend to ‘*how*’ a patient may improve pain (i.e., cognitive-behavioral strategies) without neglecting ‘*why*’ a patient may improve (i.e., MCP). Specifying which elements of meaning in life (i.e., coherence, significance, purpose) may be of particular interest in future intervention trials.

Lastly, this study adds to future theoretical directions of pain management. PIL displayed positive relationships with variables like health behavior engagement and negative relationships with avoidant coping strategies. While these relationships failed to impact pain, there are lessons to be garnered. Based on results, PIL may benefit mental and physical well-being outside of pain. Similar to acceptance-based perspectives on pain, future researchers may want to explore the utility of enhancing life even if pain interference remains. As previously discussed, enhancing life even in the face of high pain interference could be an alternative aim for people with severe and stable pain levels.

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APPENDIX A

Chronic Pain and Purpose in Life Study



Are you living with Chronic Pain?

Are you 18 years of age or older?

You may be eligible to participate this study where you can earn \$10!

Purpose

The purpose of this study is to characterize the relationship between purpose in life and pain among people living with chronic pain. This study is being conducted by Dr. Bernadette Heckman (Principal Investigator), Professor of Counseling Psychology, and Addison Monroe (Co-Investigator), a Counseling Psychology Ph.D. student.

Study Requirements

Upon completing an eligibility screener and providing informed consent, you will simply be asked to complete a survey. The survey will take approximately 15 to 25 minutes to complete. You may drop out of the study at any time.

Compensation and Benefits

If you complete the survey, you will be compensated with a \$10 Amazon e-gift card within 2-3 weeks of completing the survey. You will also benefit from participating by knowing you have contributed to research that aims to improve treatments for individuals living with chronic pain.

How Do I Participate?!

Scan the QR code to the right, or go to

https://ugeorgia.ca1.qualtrics.com/jfe/form/SV_8enuHOjAyh3XvO6

to see if you are eligible. If you are eligible, you will be directed to the survey.

Questions?

Please direct all questions to Addison Monroe, the co-investigator, at addison.monroe@uga.edu or 762-233-8090.



APPENDIX B

Demographics Survey**What sex were you assigned at birth?**

- Male
- Female
- Intersex
- Other
- If other, specify sex assigned at birth:

What is your current gender identity?

- Male
- Female
- Transgender Male
- Transgender Female
- Other
- If other, specify current gender identity:

What is your ethnicity? (Please mark only one box.)

- Hispanic or Latino
- Not Hispanic or Latino

What is your race? (Mark as many boxes as apply.)

- American Indian/Alaskan Native
- Asian
- Native Hawaiian or Other Pacific Islander
- Black or African American
- White
- Other (Specify)

What is the highest year of education you completed? (Mark as many boxes as apply.)

Less than 6th grade	10th grade	Associates Degree
6th grade	11th grade	Bachelor's Degree
7th grade	12th grade (high school diploma)	Master's Degree
8th grade	GED	Doctorate Degree
9th grade	Some college classes	

What is your current employment status? (Mark as many boxes as apply.)

- Working full time (35 or more hours per week)
- Working part time (fewer than 35 hours per week)
- Unemployed

- Student (either full- or part-time)
- Social Security Disability
- Supplemental Security Income
- Veterans Disability Benefits
- Other (Explain)

What is your household income?

Less than \$5,000	\$30,000 - \$34,999
\$5,000 - \$9,999	\$35,000 - \$39,999
\$10,000 - \$14,999	\$40,000 - \$44,999
\$15,000 - \$19,999	\$45,000 - \$49,000
\$20,000 - \$24,999	\$50,000 or more
\$25,000 - \$29,999	Don't know

How would you describe your current relationship status?

Legally Married	Separated
Legal Domestic Partner	Widowed
Partnered	Single
Divorced	

What is your current housing status?

- I own my own home
- I am currently renting my home
- I am currently renting an apartment
- I am currently living with family (not in my home or apartment)
- I am currently living in a homeless shelter or related environment
- I am currently homeless

What is your current age (in years)?

Describe your current chronic pain condition: