



Chronic pain acceptance incrementally predicts disability in polytrauma-exposed veterans at baseline and 1-year follow-up



Andrew J. Cook^{a, b, c}, Eric C. Meyer^{a, b, c, *}, Lianna D. Evans^{a, b}, Kevin E. Vowles^d, John W. Kloeck^e, Nathan A. Kimbrel^{f, g, h}, Suzy Bird Gulliver^{c, i}, Sandra B. Morissette^{a, b, c}

^a Department of Veterans Affairs, VISN 17 Center of Excellence for Research on Returning War Veterans, Waco, TX, USA

^b Central Texas Veterans Health Care System, Temple, TX, USA

^c Texas A&M Health Science Center, College of Medicine, Temple, TX, USA

^d Department of Psychology, University of New Mexico, Albuquerque, NM, USA

^e Department of Psychology and Neuroscience, Baylor University, Waco, TX, USA

^f Durham VA Medical Center, Durham, NC, USA

^g VA Mid-Atlantic Mental Illness Research Education and Clinical Center, Durham, NC, USA

^h Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC, USA

ⁱ Warriors Research Institute, Baylor Scott & White Healthcare System, Waco, TX, USA

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ABSTRACT

War veterans are at increased risk for chronic pain and co-occurring neurobehavioral problems, including posttraumatic stress disorder (PTSD), depression, alcohol-related problems, and mild traumatic brain injury (mTBI). Each condition is associated with disability, particularly when co-occurring. Pain acceptance is a strong predictor of lower levels of disability in chronic pain. This study examined whether acceptance of pain predicted current and future disability beyond the effects of these co-occurring conditions in war veterans. Eighty trauma-exposed veterans with chronic pain completed a PTSD diagnostic interview, clinician-administered mTBI screening, and self-report measures of disability, pain acceptance, depression, and alcohol use. Hierarchical regression models showed pain acceptance to be incrementally associated with disability after accounting for symptoms of PTSD, depression, alcohol-related problems, and mTBI (total adjusted $R^2 = .57$, $p < .001$, $\Delta R^2 = .03$, $p = .02$). At 1-year follow-up, the total variance in disability accounted for by the model decreased (total adjusted $R^2 = .29$, $p < .001$), whereas the unique contribution of pain acceptance increased ($\Delta R^2 = .07$, $p = .008$). Pain acceptance remained significantly associated with 1-year disability when pain severity was included in the model. Future research should evaluate treatments that address chronic pain acceptance and co-occurring conditions to promote functional recovery in the context of polytrauma in war veterans.

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Chronic pain and pain-related disability¹ are prevalent and significant problems among returning U.S. war veterans, occurring in up to 60% of those returning from recent conflicts (Adler et al., 2011; Butchart, Kerr, Heisler, Piette, & Krein, 2009; Dobie et al., 2004; Dobscha et al., 2009; Haskell et al., 2012; Kerns, Otis, Rosenberg, & Reid, 2003; Rodriguez, Holowka, & Marx, 2012;

Ruff, Ruff, & Wang, 2009). Chronic pain is strongly associated with functional disability in both the general population (Brevik, Collett, Ventafridda, Cohen, & Gallacher, 2006; Smith et al., 2001) and in samples of war veterans (Barry, Guo, Kerns, Duong, & Reid, 2003; Dobscha et al., 2009; Helmer et al., 2009; Matthias, Miech, Myers, Sargent, & Bair, 2014). The long-term course of chronic pain is characterized by low recovery rates and relatively static pain severity, with as many as 80% of those with chronic pain continuing to report chronic pain after four to twelve years, and increased mortality (Andersson, 2004; Elliott, Smith, Hannaford, Smith, & Chambers, 2002).

Chronic pain frequently co-occurs with a number of common mental health and neurobehavioral conditions, including

* Corresponding author. VA VISN 17, Center of Excellence for Research on Returning War Veterans, Central Texas Veterans Healthcare System (151C), Waco, TX, 76711, USA.

E-mail address: Eric.Meyer2@va.gov (E.C. Meyer).

¹ The World Health Organization (WHO) defines disability as an umbrella term, encompassing impairment, activity limitations, and participation restrictions (<http://www.who.int/topics/disabilities/en/>).

posttraumatic stress disorder (PTSD), mild traumatic brain injury (mTBI), depression, and alcohol-related problems, each of which is associated with increased disability in Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans (Adler et al., 2011; Higgins et al., 2014; Holowka & Marx, 2011; Kehle et al., 2012; Matthias et al., 2014; Otis et al., 2010; Rodriguez et al., 2012). Thus, in this population, there are multiple potential contributors to impairment and disability. For example, higher levels of pain disability are associated with lower levels of pain severity among veterans with comorbid pain and clinical PTSD symptoms, in comparison to veterans with pain in the absence of PTSD symptoms (Alschuler & Otis, 2014).

The Veterans Health Administration (VHA) recognizes the importance of complex injuries resulting in such comorbidities. VHA defines polytrauma as “involving two or more injuries to physical regions or organ systems that result in various physical and/or psychosocial impairments and disability” (Veterans Health Administration, 2006). This common presentation of comorbid conditions and symptoms, labeled as post-deployment syndrome (PDS) (Lewis et al., 2012) or post-deployment multi-symptom disorder (PDMSD) (Walker, Clark, & Sanders, 2010), has gained increasing clinical and research attention. For example, in a sample of veterans treated in a VHA polytrauma program, the rate of co-occurrence among chronic pain, PTSD and persistent post-concussive symptoms was 42%, with an additional 36% being diagnosed with two of these three conditions (Lew et al., 2009). Ten to twenty-three percent of those deployed to Afghanistan and Iraq experience some form of TBI, the vast majority of which are mTBIs, and 22–95% of those with a TBI are estimated to develop a pain condition (Bosco, Murphy, & Clark, 2013; Gironde et al., 2009). Importantly, the co-occurrence of these conditions is associated with high healthcare costs (e.g., Outcalt, Yu, Hoen, Pennington, & Krebs, 2014). In a study by Taylor et al. (2012), veterans receiving VHA healthcare who were diagnosed with comorbid TBI, chronic pain, and PTSD had the highest median costs per patient.

In civilians, acceptance of chronic pain has been found to be a potent predictor of lower levels of disability (McCracken, Vowles, & Eccleston, 2004; McCracken & Vowles, 2008; Reneman, Kijkstra, Geertzen, & Dijkstra, 2010). Chronic pain acceptance is defined as “a behavior pattern of engagement in activity with pain present, but without restrictions by pain, or attempts to avoid or control pain” (McCracken & Vowles, 2008, p. 216). Attempts to manage chronic pain are often dominated by efforts to control the pain or associated experiences, behaviors, thoughts and/or feelings via medical, physical, behavioral or psychological strategies. Such efforts can be unsuccessful and can themselves contribute to distress and/or disability. Chronic pain acceptance emphasizes a willingness to experience pain or related distress without direct attempts to control them (see Thompson & McCracken, 2011 for a review). It predicts chronic pain adjustment and functioning beyond the influences of other common predictors such as pain severity, pain anxiety, attention to pain, and depression, over both the short and long term (McCracken et al., 2004; Thompson & McCracken, 2011). It is a stronger predictor of multiple dimensions of pain-related physical and psychosocial functioning than more control-based pain coping strategies (e.g., distraction, activity pacing, relaxation techniques, altered self-talk) (Thompson & McCracken, 2011). As a theoretical construct, acceptance of chronic pain is part of what is referred to as the contextual framework, as reflected in acceptance and commitment therapy (ACT) and other mindfulness- and acceptance-based treatment models (McCracken & Vowles, 2014; Thompson & McCracken, 2011). To our knowledge, no studies have examined the influence of chronic pain acceptance on disability among veterans while accounting for the influence of common co-occurring conditions.

The objective of the present study was to examine whether acceptance of chronic pain would predict current and future (i.e., one year) disability beyond the effects of PTSD, depression, alcohol-related problems, mTBI, and pain severity among trauma-exposed war veterans with chronic pain. We hypothesized that pain acceptance would be incrementally associated with current disability after accounting for the influence of PTSD, depression, alcohol-related problems, and mTBI, such that higher pain acceptance would predict lower current disability (Hypothesis 1), and that higher pain acceptance would similarly predict lower disability at 1-year follow-up (Hypothesis 2). Finally, in a subset of veterans who provided information on pain severity, we hypothesized that chronic pain acceptance would incrementally predict lower disability at 1-year follow-up after accounting for pain severity and the other predictors (Hypothesis 3).

1. Methods

1.1. Participants

A total of 117 participants were enrolled in a parent longitudinal study and also participated in a companion study examining predictors of mental health problems and functional impairment among OEF/OIF veterans enrolled at the Central Texas Veterans Health Care System (CTVHCS). Individuals were excluded if they: (a) met criteria for a diagnosis of schizophrenia or other psychotic disorder, or bipolar disorder; (b) reported current suicidal or homicidal risk that warranted crisis intervention; (c) had recently begun (i.e., had not reached stabilization as indicated by less than three months of consistent treatment) psychiatric medications or psychotherapy; or (d) were unable to comprehend or complete the assessments. Recruitment involved over-sampling veterans with one or more lifetime mental health diagnoses other than the excluded diagnoses. All participants were enrolled in the parent study and then invited to participate in the second study if they met the additional inclusion criterion of being exposed to one or more potentially traumatic events that met *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV; American Psychiatric Association, 2000) criterion A for PTSD during their military service. Most of the sample ($n = 80$; 68.4%) reported currently experiencing chronic pain and were included in the present analyses.

Demographic and descriptive characteristics of the sample are shown in Table 1. The ratio of males (86.3%) to females was representative of the 2013 gender distribution of veterans ages 20 to 64 nationally (i.e., 13.5% females, U.S. Department of Veterans Affairs, 2014). The majority of the sample (86.0%) served in the Army. Based on structured clinical interviews, the majority met criteria for military-related PTSD (i.e., related to any type of traumatic stressor(s) occurring during their service in support of OEF/OIF; 55% current; 75% lifetime).

Additional data regarding chronicity, frequency, and severity of chronic pain were obtained at baseline for a subset of participants ($n = 55$, 68.8%), due to these questions being added after the study was underway. The majority of participants ($n = 71$; 88.8%) completed a functional assessment at one-year follow-up. All participants who provided the additional pain data ($n = 55$) completed the 1-year follow-up assessment.

1.2. Procedures

All study procedures were reviewed and approved by the CTVHCS Institutional Review Board prior to data collection. Participants were recruited through direct mailings, advertisements at enrollment sites, and presentations to clinical staff. Following

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