Published in final edited form as:
Psychol Serv. 2022 February ; 19(1): 95–102. doi:10.1037/ser0000506.

Cognitive Behavioral Therapy for Chronic Pain in Veterans: Evidence for Clinical Effectiveness in a Model Program

Jennifer L. Murphy, Ph.D.[1,2], **Matthew J. Cordova, Ph.D.**[3,4], **Eric A. Dedert, Ph.D.**[5,6,7]

[1]James A. Haley Veterans' Hospital, Tampa, FL

[2]Department of Neurology, University of South Florida Morsani College of Medicine, Tampa, FL

[3]VA Northern California Health Care System, Martinez, CA

[4]Department of Psychology, Palo Alto University, Palo Alto, CA

[5]Durham VA Health Care System, Durham, NC

[6]Department of Veterans Affairs Mid-Atlantic Mental Illness Research, Education, and Clinical Center, Durham, North Carolina

[7]Department of Psychiatry & Behavioral Sciences, Duke University, Durham, NC

Abstract

Department of Veterans Affairs (VA) has been training clinicians in its Cognitive Behavioral Therapy for Chronic Pain (CBT-CP) structured protocol since 2012. The aim of this project was to review patient outcomes to determine the effectiveness of the VA's CBT-CP treatment. From 2012–2018, 1,331 Veterans initiated individual CBT-CP treatment as part of the training program. Patient outcomes were assessed with measures of patient-reported pain intensity, pain catastrophizing, depression, pain interference, and quality of life (physical, psychological, social, and environmental). Mixed models of the effects of time indicated significant changes across pre-treatment, mid-treatment, and treatment conclusion on all outcomes. There was a large effect size (Cohen's $d = 0.78$) for pain catastrophizing, and medium-to-large effect sizes ($d > 0.60$) for worst pain intensity, pain interference, depression, and physical quality of life. Systematic training of therapists and implementation of VA's CBT-CP protocol yielded significant patient improvements across multiple domains. This offers strong support for VA's CBT-CP as an effective, safe treatment for Veterans with chronic pain and highlights it as a model to increase the availability of training in standardized, pain-focused, evidence-based, behavioral interventions. Findings suggest that the broad dissemination of such training, including in routine, non-pain specialty settings, would improve patient access to effective, nonpharmacological treatment options in both the public and private sector.

Keywords

cognitive behavioral therapy; chronic pain; Veterans; training

Correspondence should be addressed to Dr. Jennifer L. Murphy, Pain Psychology Program Manager, James A Haley Veterans' Hospital, 13000 Bruce B. Downs Blvd, Tampa, Florida 33612; 813-849-3180; Jennifer.Murphy2@va.gov.

Introduction

Chronic pain is a widespread problem in the United States and worldwide, and evidence suggests that it is even more pervasive among military Veterans (Goulet et al., 2016; Kerns et al., 2011; Nahin, 2017; Yu et al., 2003). The biopsychosocial model is recognized as the best approach for understanding and treating chronic pain due to the complex factors impacting the pain experience. Despite this, historically there has been a strong emphasis on biomedical factors and treatments. Psychological interventions for pain often have been relegated to the status of last resort or reserved for those with significant mental health concerns. In recent years, concerning trends in opioid-related morbidity, mortality, and misuse have spurred interest in nonpharmacological approaches. The Centers for Disease Control and Prevention (CDC) and others released updated guidance (Dowell et al., 2016; VA/DoD Clinical Practice Guideline, 2017; U.S. Department of Health and Human Services, 2019) offering a more conservative approach to the use of opioids for chronic pain and emphasizing evidence-based nonpharmacological options as first line treatments.

Cognitive Behavioral Therapy (CBT) is considered the gold standard psychosocial intervention for chronic pain (Williams et al., 2012; Ehde et al., 2014; Skelley et al., 2018). CBT for chronic pain (CBT-CP) is about changing one's response to and relationship with pain so that it has a less deleterious impact on functioning and quality of life (Knoerl et al., 2016). The focus is on how one's thoughts, beliefs, emotions, physiological responses, and behaviors affect the pain experience. While CBT-CP protocols vary somewhat across studies and clinical usage, they emphasize three components: 1) cognitive restructuring for unhelpful thoughts; 2) paced behavioral activation to increase movement and engagement; 3) relaxation training to improve sympathetic nervous system responses.

There is ample evidence of the effectiveness of CBT-CP in patient outcomes, reflecting improvements in pain intensity, cognitions such as pain-related catastrophizing, physical functioning, coping skills, and self-efficacy (Ehde et al., 2014; Stewart et al., 2015; Schutze, et al., 2018; Darnall, 2018). A 2012 Cochrane review (Williams et al., 2012) that included 4788 participants found that CBT-CP had moderate size effects on mood and catastrophizing, and small effects on pain and disability at treatment conclusion. A 2015 review of randomized controlled trials (RCTs; Richmond et al., 2015) that included 3359 participants with non-specific cLBP found that cognitive behavioral treatments yielded moderate to large effects for pain and disability in both the short- and long-term versus guideline-based active treatments. The Agency for Healthcare Research and Quality (Skelly et al., 2018) conducted a review to evaluate which noninvasive, nonpharmacological treatments for common chronic pain conditions (i.e., chronic low back and neck pain, fibromyalgia, osteoarthritis, chronic tension headache) improved pain and function for at least 1 month post treatment. While there was a moderate strength of evidence for psychological therapies on the whole, CBT was most consistently associated with pain-related improvements. CBT-CP for conditions such as fibromyalgia, rheumatoid arthritis, and orofacial pain have all shown relatively small but robust effects that are equally effective or better when compared to other treatments (Ehde et al, 2014).

Despite evidence and recommendations for CBT-CP as a first line treatment for chronic pain (Dowell et al., 2016; VA/DoD Clinical Practice Guideline, 2017; U.S. Department of Health and Human Services, 2019), the availability of clinicians with competence in CBT-CP remains less than adequate (Darnall et al., 2016). Department of Veterans Affairs has been a leader in implementing systematic trainings to ensure that veterans have access to evidence-based psychotherapeutic approaches, including CBT-CP. In 2012, VA developed a CBT-CP protocol and training program that includes didactic attendance, recording and evaluation of treatment sessions, and ongoing expert consultation (Stewart et al., 2015). Therapists from all settings were eligible for training including mental health clinics, primary care, and medical clinics. Each therapist provides CBT-CP to two veterans with the goal of improving pain-related functioning. Data from the first two training cohorts were reported previously by Stewart et al. (2015) who found trained therapists were competent and effective in the delivery of CBT-CP, as assessed through a structured rating process. Given that, this paper focuses on effectiveness in Veteran outcomes for subsequent cohorts of the CBT-CP training program between 2012 and 2018.

The objective of this program evaluation report is to determine the clinical effectiveness of cognitive behavioral therapy for chronic pain for military Veterans in routine clinical settings. We expected that CBT-CP treatment provided by newly trained clinicians would be associated with statistically significant decreases in pain intensity, pain catastrophizing, pain interference, and depressive symptoms. We also expected that VA's CBT-CP treatment would be associated with statistically significant increases in quality of life.

Materials and Methods

Patients and Procedures

A total of 1,331 Veterans who presented to a variety of settings in the VA healthcare system with complaints of chronic pain and pain-related impairments entered the treatment. To be included in the program, they agreed to recording of sessions by therapists in CBT-CP training between 2012 and 2018. Only those Veterans who initiated treatment were included; information regarding those who declined participation is unknown. Those with all pain locations and conditions were included and presence of other mental health comorbidities was acceptable as long as they agreed to pain as the focus for the current treatment. Patients were excluded from CBT-CP only if they had active untreated psychotic symptoms, were abusing substances, or had current suicidal ideation or other psychiatric issues requiring acute stabilization. Patient outcomes data were collected as a part of the routine program evaluation for the VA National Evidence-Based Psychotherapy Training Program. Data collection and statistical analyses were reviewed and determined to be consistent with non-research quality improvement activities by the chief consultant of the VA Office of Mental Health and Suicide Prevention.

CBT-CP VA Protocol and Manual

The CBT-CP protocol was developed by a group of subject matter experts following an extensive review of the literature. Core content areas were incorporated into sessions. CBT-CP is a structured, time-limited intervention that teaches patients how to better manage

chronic pain and improve their quality of life. The VA's CBT-CP Therapist Manual was completed in early 2014 (Murphy et al., 2014) and became the primary resource for the training initiative as well as for implementation of CBT-CP across the VA healthcare system (trainings in 2012–2013 utilized slides containing the same protocol presented in the manual, maintaining continuity across training cohorts). Part I of the manual (Murphy et al., 2014) includes foundational information about chronic pain, such as types of pain, treatment options, evidence review, case examples, and critical elements for CBT-CP. Part II of the manualized protocol (Murphy et al., 2014) includes the 11 core CBT-CP sessions and 1 follow-up booster session which is recommended but optional, provided in Table 1. Detailed content for each session is provided (Murphy et al., 2014) and includes agenda setting, subject matter review, patient materials for learning and home practice, as well as examples of therapist scripting. In addition, therapeutic interactions in this sample were recorded with Veteran consent and rated by CBT-CP consultant experts using a standardized rating scale to ensure fidelity, accuracy, and clinical acumen (Stewart et al., 2015).

Measures

All patient outcome measures were reported at the beginning (session 1), middle (session 7), and conclusion (session 11) of treatment.

Pain intensity.—Pain intensity was assessed using the 11-point Pain Numeric Rating Scale (Pain NRS; Von Korff et al., 2000) with 0 meaning "no pain" and 10 meaning the "worst pain imaginable." Patients rated their "worst pain," "average pain," and "least pain" for the past week. The NRS is used throughout VA and other healthcare systems and has been validated as a treatment outcome measure (Jensen et al., 1986; Jensen & Karoly, 2001). Minimally, moderately, and substantially important clinical change are represented by a decrease in score by 10–30%, ≥ 30%, and ≥ 50%, respectively (Dworkin et al., 2008).

Pain catastrophizing.—The Pain Catastrophizing Scale (PCS) (Sullivan et al., 1995) is a 13-item self-report measure of the tendency to ruminate, magnify, or feel hopeless (i.e., catastrophize) about pain. Each item is rated on a 5-point scale ranging from 0 "not at all" to 4 "all the time," with a total summed scale score ranging from 0–52. A score of 30 or above is suggestive of clinically relevant levels of catastrophizing (Sullivan et al., 1995).

Pain interference.—Pain-related interference was assessed using the Interference Subscale of the West Haven-Yale Multidimensional Pain Inventory (WHYMPI-INT; Kerns et al., 1985). It assesses the impact of pain in multiple areas such as work, daily activities, and relationships with others. Level of interference is calculated as the mean of 9 items rated 0 "no interference/change" to 6 "extreme interference/change," with higher scores indicating greater pain interference. Psychometric adequacy of this interference subscale has been evaluated for various pain conditions and mean decrease of 0.6 points is consistent with clinically important change (Dworkin et al., 2008).

Depression.—Over the course of the CBT-CP cohorts reported in this sample, two measures of depression were used. From 2012–2014 (i.e., cohorts 3–8), the Beck Depression Inventory-II (BDI-II; Beck et al., 1996) was used. In 2015 (i.e., cohorts 9–36), the program

shifted to using the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) to assess depression severity. The BDI-II is a 21-item self-report measure where each item is scored on a 0–3 scale and the total score is calculated by summing the items (range 0–63), with higher scores indicating greater symptom severity. Severity is reflected in the total score from minimal (range 0–13), mild (range 14–19), moderate (range 20–28), to severe depression (range 29–63; Beck et al., 1996). The PHQ-9 (Kroenke et al., 2001) is a 9-item measure that indicates severity of depression using each of the 9 DSM-IV depression criteria (American Psychiatric Association, 1994). Items are scored from 0–3 (i.e., not at all to nearly every day) with total scores greater than 4 indicating depression from mild (range 5–9), moderate (range 10–14), moderately severe (range 15–19), to severe (≥20). The psychometric properties as both reliable and valid measures of depressive severity have been well-established for the BDI-II and PHQ-9 (Kroenke et al., 2001; Wang & Gorenstein, 2013).

Quality of life.—The World Health Organization Quality of Life-BREF (WHOQOL-BREF; WHOQOL Group, 1998) is an abbreviated version of the WHOQOL-100 that has 26 items and has been shown to have good validity and reliability. There are 24 items which assess 4 quality of life domains (physical health, psychological well-being, social relationships, and environment) and 2 overall health and satisfaction domains. Total scores for each domain range from 4–20, with higher scores indicating perception of better quality of life on that domain (WHOQOL Group, 1998).

Analysis Plan

All analyses were conducted with SAS version 9.4 software. We first calculated descriptive statistics and frequencies. Outcome variables were plotted using histograms to evaluate their distributions. Treating clinicians coded treatment completion dichotomously, and we used logistic regression of baseline sociodemographic and symptom variables to evaluate predictors of treatment completion. To evaluate change over time, we estimated mixed effects models for all patient-level outcome measures, with intercept modeled as a random effect. We coded the initial (session 1), mid-point (session 7), and final (session 11) evaluations as 0, 0.6, and 1.0, respectively. Missing data were estimated using the full information maximum likelihood method so that all patients could be used in estimates of effect presented in the results. Simulation research has found that maximum likelihood estimation provides a good estimate of the intent-to-treat effect of an intervention (Witkiewitz et al., 2014). We modeled outcome scores as a function of session for within-treatment estimates of effect. We calculated within-subjects effect sizes (Cohen's *d*) by dividing the slope estimate of the treatment effect by the standard deviation (*SD*) of the relevant measures at session 1.

Results

Sample Characteristics

Table 2 presents baseline sociodemographic data for the 1,331 veterans who initiated treatment and provided data on treatment outcomes. Generally, the sample was made up of Veterans who were male (81%) and Caucasian/White race (69%), with a mean age of 52.3

years old (*SD* = 12.4). The most common military service eras were Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn (24%), the Vietnam era (13%), and the Post-Vietnam era (22%).

Treatment Completion

Of the 1,331 patients providing outcome data, 775 (58%) completed treatment, as indicated by attending 11 or more treatment sessions (i.e., all CBT-CP treatment sessions). A total of 1,059 (80%) completed 5 or more sessions, 188 (14%) completed 2–4 sessions, and 84 (6%) completed 0 or 1 session. Reasons for not completing treatment included disinterest, logistics (e.g., scheduling conflicts, time), and health crises/comorbidities. Logistic regression analyses found that treatment completion was more likely in Veterans of more advanced age, *Odds Ratio (OR)* = 1.01, *95% Confidence Interval (CI%)* = 1.002–1.023 and in Veterans with lower session 1 pain-related interference, *OR* = 1.19, *95% CI* = 1.06–1.34. No other sociodemographic, military service, or session 1 values of the outcome variables predicted odds of treatment completion.

Outcomes

Mixed effects models with random intercept and maximum likelihood estimation of missing data were used to test the effect of time (pre-treatment/session 1, mid-treatment/session 7, treatment conclusion/session 11) on each outcome variable. Descriptive statistics for primary outcomes over time are displayed in Table 3. Results for mixed effects models of change over time are displayed in Table 4.

Results showed improvement across time on all outcome measures. There were significant effects of time on Pain NRS ratings for “worst pain”, $F(1, 1837) = 220.28$, $p < .001$, indicating a medium-to-large effect size, Cohen’s $d = 0.65$. Based on the last observation of “worst pain” collected for each patient, minimally important clinical change was reported by 314/1277 (25%) patients who provided any “worst pain” rating data, moderately important clinical change was reported by 69/1277 (5%) patients, and substantially important clinical change was reported by 52/1277 (4%) patients. Based on end-of-treatment “worst pain” for patients providing data at session 11, minimally important clinical change was reported by 264/775 (34%) patients, moderately important clinical change was reported by 61/775 (8%) patients, and substantially important clinical change was reported by 44/775 (6%) patients. There were significant effects of time on Pain NRS ratings for “average pain”, $F(1, 1758) = 141.83$, $p < .001$, indicating a medium effect size, Cohen’s $d = 0.43$. Based on the last observation of “average pain” collected for each patient, minimally important clinical change was reported by 282/1277 (22%) patients who provided any “average pain” rating data, moderately important clinical change was reported by 85/1277 (7%) patients, and substantially important clinical change was reported by 91/1277 (7%) patients. Based on end-of-treatment “average pain” for patients providing data at session 11, minimally important clinical change was reported by 230/775 (30%) patients, moderately important clinical change was reported by 76/775 (10%) patients, and substantially important clinical change was reported by 82/775 (11%) patients. Finally, there was a statistically significant effect of time for “least pain,” $F(1, 1717) = 39.67$, $p < .001$, indicating a very small effect size, Cohen’s $d = 0.20$. Based on the last observation of “least pain” collected for each

patient, minimally important clinical change was reported by 148/1244 (12%) patients who provided any "least pain" rating data, moderately important clinical change was reported by 102/1244 (8%) patients, and substantially important clinical change was reported by 159/1244 (13%) patients. Based on end-of-treatment "least pain" for patients providing data at session 11, minimally important clinical change was reported by 122/775 (16%) patients, moderately important clinical change was reported by 82/775 (11%) patients, and substantially important clinical change was reported by 143/775 (18%) patients.

There was also a significant effect of time on pain interference (WHYMPI-INT), $F(1, 1623) = 490.47$, $p < .001$, indicating a medium-to-large effect size, Cohen's $d = 0.70$. Based on the last observation of pain interference collected for each patient who provided any pain interference data, clinically important change (i.e., decrease of ≥ 0.6 points) was reported by 440/1154 (38%) patients. Based on end-of-treatment pain interference for treatment completers, clinically important change (i.e., decrease of ≥ 0.6 points) was reported by 388/775 (50%) patients.

There was a significant effect of time on pain catastrophizing (PCS), $F(1, 1762) = 751.14$, $p < .001$, indicating a large effect size, Cohen's $d = 0.78$. Significant effects of time on depression were found both for patients that completed the BDI-II, $F(1, 221) = 95.16$, $p < .001$, indicating a medium-to-large effect size, Cohen's $d = 0.66$, and for those that completed the PHQ-9, $F(1, 1667) = 527.82$, $p < .001$, indicating a medium-to-large effect size, Cohen's $d = 0.70$. Finally, significant effects of time on all four quality of life domains (WHOQOL-BREF) were found, including physical health, $F(1, 1669) = 464.08$, $p < .001$, indicating a medium-to-large effect size, Cohen's $d = 0.65$, psychological well-being, $F(1, 1639) = 334.47$, $p < .001$, indicating a medium effect size, Cohen's $d = 0.48$, social relationships, $F(1, 1653) = 138.71$, $p < .001$, indicating a small effect size, Cohen's $d = .33$, and environment, $F(1, 1634) = 172.14$, $p < .001$, indicating a small effect size, Cohen's $d = .34$.

Discussion

Chronic pain is highly prevalent in the Veteran population, complicates the management of comorbid medical and mental health conditions, and has a profound impact on veterans' quality of life and on the VA healthcare system. Given updates in chronic pain treatment guidelines and the substantial evidence base for nonpharmacological, behavioral approaches to pain management, there is a tremendous need for effective treatment protocols that can be widely disseminated and implemented in clinical practice. To our knowledge, this report represents the largest evaluation of CBT-CP outcomes in a real-world clinical setting. In addition, it is set apart from much other CBT-CP pragmatic research, as therapy was guided by a manualized protocol and was closely monitored and rated to ensure clinical adherence and competence. This is of particular import as there has been a noted need in the literature to improve the quality and consistency of the delivery of psychological therapies for chronic pain (Williams et al., 2012).

Veterans showed improvement on all outcomes across the course of treatment with CBT-CP. Reductions in pain intensity ratings for "worst pain" and "average pain" in the past week

were statistically significant and reflected medium-to-large effect sizes, with a very small effect size for reductions in “least pain”. The magnitude of these changes represented a 10–20% reduction which is less than minimal in the context of guidelines for clinical significance. Despite this modest reduction in pain ratings, patients experienced robust improvement on measures of psychosocial functioning. Pain catastrophizing, a risk factor for disability and distress in chronic pain patients (Leung, 2012) showed an almost 10-point drop from baseline to treatment conclusion; this large effect was also clinically significant as scores at treatment conclusion were well-below the clinical cut-off (i.e., 30) at the group level (Sullivan et al., 1995). Similarly, pain interference, reflective of the extent to which pain posed an obstacle to daily functioning, was reduced by an effect size of $d = 0.70$, reflecting an effect that was also clinically significant (i.e., >.6) at the group level. Medium-to-large, clinically significant effects were also found on both measures (BDI-II, PHQ-9) of depression; for example, mean BDI-II scores dropped from moderate to mild severity. Finally, quality of life showed improvement from baseline to treatment conclusion, with small to medium-large effect sizes with regard to physical, psychological, social, and environmental indices. Thus, treatment provided by newly trained therapists in VA’s CBT-CP program effectively helped Veterans change their relationship with, response to, and management of chronic pain. Overall, the treatment effect sizes observed in this program evaluation project were similar to or greater than the small to moderate effect sizes found in a review that compared CBT-CP interventions to waitlist or usual control (Williams et al., 2012). While the current report did not have a comparison group, the effect sizes observed in this project support the effectiveness of CBT-CP when provided in routine clinical settings by clinicians receiving formal training.

CBT-CP is recommended as a first line treatment for chronic pain; however, there remains a general shortage of clinicians who are trained to competence to provide behavioral interventions for chronic pain (Dowell et al., 2016; VA/DoD Clinical Practice Guideline, 2017; U.S. Department of Health and Human Services, 2019). The VHA National Evidence-Based Psychotherapy Training Program initiative represents a model for how to increase clinician competence and patient access to these needed behavioral modalities for pain. Since those providing treatment were newly trained, it is reasonable to surmise that the noteworthy patient gains might only increase with additional therapist experience. Unfortunately, access to healthcare professionals who can provide CBT-CP remains highly limited in the private sector and numerous barriers remain regarding this issue. First, no similar large-scale, systematic training programs exist for mental health providers outside of VA. Since there is no standardization of what constitutes training in pain psychology, identifying a clinician who is adequately trained to assist an individual with chronic pain is challenging. In addition, when prescribing providers want to make such a referral, they often do not have clear guidance on how to access this clinical pathway. Finally, reimbursement from third party payers remains problematic. Despite ample evidence to support the use of behavioral treatment for chronic pain, it is not recognized by some insurance companies as a core component of treatment. These unfortunate realities must shift so that individuals with chronic pain can incorporate needed behavioral medicine into their treatment and feel empowered to live a full and rewarding life despite pain.

This project had a number of strengths including the large clinical sample, pragmatic *in vivo* application of the intervention, and the clearly defined CBT-CP protocol that was used and evaluated. However, this project also has several limitations. First, there was substantial attrition, such that 58% (n = 775) of the 1,331 Veterans who initiated the treatment were coded by their clinicians as treatment completers. While this is not surprising in the context of an effectiveness trial with this complex patient population, and although the final sample did not demographically differ from non-completers on any variable other than age, it does suggest the need for careful attention to patient selection and retention strategies in the implementation of CBT-CP. It may also indicate the need for briefer behavioral options for those who are not best suited to this form of CBT-CP or are not yet ready to engage in it. Future research examining implementation factors that may have affected engagement in treatment would be beneficial for this population. Second, ideally the entire patient cohort would have completed a single depression measure but there was a shift in the latest cohorts due to a shift in VA screening practices. On a positive note, both the BDI-II and the PHQ-9 yielded large effects. Regarding generalizability, the population reflects the Veteran population versus the U.S. population and therefore males are over-represented. Having said that, the percent of females in the group at 18% is higher than that of females in the general VA population at 7.5% (Frayne et al., 2018). Finally, since this report involved a retrospective analysis of program evaluation data, it was not randomized and did not include a control group which would have strengthened the findings. In the future, examining potential moderators and mediators to outcomes to elucidate what works best for whom as well as evaluating briefer versions of CBT-CP for application at an earlier step of care would be useful.

Our findings for the effectiveness of VA's CBT-CP are in line with previous studies, despite the higher rates of chronic pain and impairment levels in the military population. The model program in VA highlights not only the need for increased access to behavioral medicine for chronic pain in Veterans but reinforces the need to expand the network of training and accessibility for options such as CBT-CP to all of those with chronic pain conditions. Working together, the private sector and VA healthcare system should work to enhance the broad-based dissemination of behavioral medicine strategies as a public health strategy to optimally address chronic pain.

Acknowledgements

The authors would like to extend our sincere thanks to the Veterans who engage in behavioral interventions for chronic pain and agreed to participate in treatment through the CBT-CP Training Program. In addition, we would like to express our appreciation for the time, interest, and effort of the CBT-CP clinician participants, national consultants, and regional trainers. Without each of them, VA's CBT-CP would not be a success. Finally, we would like to offer our deep gratitude to Hani Shabana, PhD, VA National CBT-CP Training Program Coordinator. Dr. Shabana has provided ongoing support and encouragement for the authors and for others involved in the CBT-CP Training Program.

This work was supported in part by Merit Review Award l01 CX001757 from the United States (U.S.) Department of Veterans Affairs Clinical Sciences R&D (CSRD) Service. This project was supported by the National Evidence-Based Psychotherapy Training Program, Department of Veterans Affairs Office of Mental Health and Suicide Prevention. All authors are employees of the Department of Veterans Affairs, Veterans Healthcare Administration. The views expressed in this article are those of the authors and do not necessarily reflect that of the Department of Veterans Affairs or the federal government. The authors declare that there are no conflicts of interest for the current work. As authors of this manuscript, we attest that the findings were not derived, in whole or in part, from activities constituting research as described in VHA Handbook 1058.05.

This project was supported by the National Evidence-Based Psychotherapy Training Program, Department of Veterans Affairs Office of Mental Health and Suicide Prevention. The views expressed in this article are those of the authors and do not necessarily reflect that of the Department of Veterans Affairs or the federal government.

References

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC.

Beck AT, Steer RA., & Brown GK (1996). Manual for the Beck Depression Inventory-II (2nd ed.). Psychological Corporation.

Darnall BD (2018). Psychological Treatment for Patients with Chronic Pain. American Psychological Association.

Darnall BD, Scheman J, Davin S, Burns JW, Murphy JL, Wilson AC, Kerns RD, & Mackey SC (2016). Pain Psychology: A Global Needs Assessment and National Call to Action. Pain Medicine (Malden, Mass.), 17(2), 250–263. 10.1093/pm/pnv095 [PubMed: 26803844]

Dowell D, Haegerich TM, & Chou R (2016). CDC Guideline for Prescribing Opioids for Chronic Pain—United States, 2016. MMWR. Recommendations and Reports, 65(1), 1–49. 10.15585/mmwr.rr6501e1

Dworkin RH, Turk DC, Wyrwich KW, Beaton D, Cleeland CS, Farrar JT, Haythornthwaite JA, Jensen MP, Kerns RD, Ader DN, Brandenburg N, Burke LB, Cella D, Chandler J, Cowan P, Dimitrova R, Dionne R, Hertz S, Jadad AR, … Zavisic S (2008). Interpreting the clinical importance of treatment outcomes in chronic pain clinical trials: IMMPACT recommendations. The Journal of Pain: Official Journal of the American Pain Society, 9(2), 105–121. 10.1016/j.jpain.2007.09.005

Eccleston C, Williams A. C. de C, & Morley S (2009). Psychological therapies for the management of chronic pain (excluding headache) in adults. The Cochrane Database of Systematic Reviews, 2, CD007407. 10.1002/14651858.CD007407.pub2

Ehde DM, Dillworth TM, & Turner JA (2014). Cognitive-behavioral therapy for individuals with chronic pain: Efficacy, innovations, and directions for research. The American Psychologist, 69(2), 153–166. 10.1037/a0035747 [PubMed: 24547801]

Frayne SM, Phibbs CS, Saechao F, et al. (2018). Sourcebook: Women veterans in the Veterans Health Administration, volume 4: Longitudinal trends in sociodemographics, utilization, health profile, and geographic distribution. Women's Health Evaluation Initiative, Women's Health Services, Veterans Health Administration. Washington, DC: Department of Veterans Affairs.

Goulet JL, Kerns RD, Bair M, Becker WC, Brennan P, Burgess DJ, Carroll CM, Dobscha S, Driscoll MA, Fenton BT, Fraenkel L, Haskell SG, Heapy AA, Higgins DM, Hoff RA, Hwang U, Justice AC, Piette JD, Sinnott P, … Brandt CA (2016). The musculoskeletal diagnosis cohort: Examining pain and pain care among veterans. Pain, 157(8), 1696–1703. 10.1097/j.pain.0000000000000567 [PubMed: 27023420]

Hoffman BM, Papas RK, Chatkoff DK, & Kerns RD (2007). Meta-analysis of psychological interventions for chronic low back pain. Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association, 26(1), 1–9. 10.1037/0278-6133.26.1.1 [PubMed: 17209691]

James LD, Thorn BE, & Williams DA (1993). Goal specification in cognitive-behavioral therapy for chronic headache pain. Behavior Therapy, 24(2), 305–320. 10.1016/S0005-7894(05)80271-0

Jensen MP, & Karoly P (2001). Self-report scales and procedures for assessing pain in adults. In Turk DC & Melzack R (Eds.), Handbook of pain assessment (p. 15–34). The Guilford Press.

Jensen MP, Karoly P, & Braver S (1986). The measurement of clinical pain intensity: A comparison of six methods. Pain, 27(1), 117–126. [PubMed: 3785962]

Johansson C, Dahl J, Jannert M, Melin L, & Andersson G (1998). Effects of a cognitive-behavioral pain-management program. Behaviour Research and Therapy, 36(10), 915–930. [PubMed: 9714943]

Kerns RD, Turk DC, & Rudy TE (1985). The West Haven-Yale Multidimensional Pain Inventory (WHYMPI). Pain, 23(4), 345–356. [PubMed: 4088697]

Kerns Robert D., Philip EJ., Lee AW., & Rosenberger PH (2011). Implementation of the veterans health administration national pain management strategy. Translational Behavioral Medicine, 1(4), 635–643. 10.1007/s13142-011-0094-3 [PubMed: 24073088]

Knoerl R, Lavoie Smith EM, & Weisberg J (2016). Chronic Pain and Cognitive Behavioral Therapy: An Integrative Review. Western Journal of Nursing Research, 38(5), 596–628. 10.1177/0193945915615869 [PubMed: 26604219]

Kroenke K, Spitzer RL, & Williams JB (2001). The PHQ-9: Validity of a brief depression severity measure. Journal of General Internal Medicine, 16(9), 606–613. [PubMed: 11556941]

Lamb SE, Hansen Z, Lall R, Castelnuovo E, Withers EJ, Nichols V, Potter R, Underwood MR, & Back Skills Training Trial investigators. (2010). Group cognitive behavioural treatment for low-back pain in primary care: A randomised controlled trial and cost-effectiveness analysis. Lancet (London, England), 375(9718), 916–923. 10.1016/S0140-6736(09)62164-4 [PubMed: 20189241]

Leung L (2012). Pain catastrophizing: An updated review. Indian Journal of Psychological Medicine, 34(3), 204–217. 10.4103/0253-7176.106012 [PubMed: 23441031]

Murphy JL, McKellar JM, Raffa SD, Clark ME, Kerns RD, & Karlin BE (2014). Cognitive behavioral therapy for chronic pain among veterans: Therapist manual. Washington, D.C.: Department of Veterans Affairs.

Nahin RL (2017). Severe Pain in Veterans: The Effect of Age and Sex, and Comparisons With the General Population. The Journal of Pain: Official Journal of the American Pain Society, 18(3), 247–254. 10.1016/j.jpain.2016.10.021

Richmond H, Hall AM, Copsey B, Hansen Z, Williamson E, Hoxey-Thomas N, Cooper Z, & Lamb SE (2015). The Effectiveness of Cognitive Behavioural Treatment for Non-Specific Low Back Pain: A Systematic Review and Meta-Analysis. PloS One, 10(8), e0134192. 10.1371/journal.pone.0134192 [PubMed: 26244668]

Schütze R, Rees C, Smith A, Slater H, Campbell JM, & O'Sullivan P (2018). How Can We Best Reduce Pain Catastrophizing in Adults with Chronic Noncancer Pain? A Systematic Review and Meta-Analysis. The Journal of Pain: Official Journal of the American Pain Society, 19(3), 233–256. 10.1016/j.jpain.2017.09.010

Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Winter C, & Ferguson AJR (2018). Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review. Agency for Healthcare Research and Quality (AHRQ). 10.23970/AHRQEPCCER209

Stewart MO, Karlin BE, Murphy JL, Raffa SD, Miller SA, McKellar J, & Kerns RD (2015). National dissemination of cognitive-behavioral therapy for chronic pain in veterans: Therapist and patient-level outcomes. The Clinical Journal of Pain, 31(8), 722–729. 10.1097/AJP.0000000000000151 [PubMed: 25171637]

Sullivan MJL, Bishop SR, & Pivik J (1995). The Pain Catastrophizing Scale: Development and validation. Psychological Assessment, 7(4), 524–532. 10.1037/1040-3590.7.4.524

Turner JA, & Clancy S (1986). Strategies for coping with chronic low back pain: Relationship to pain and disability. Pain, 24(3), 355–364. [PubMed: 2938059]

Turner JA, & Jensen MP (1993). Efficacy of cognitive therapy for chronic low back pain. Pain, 52(2), 169–177. [PubMed: 8455964]

U.S. Department of Health and Human Services, Office of the Assistant Secretary for Health. (2016). National Pain Strategy: A Comprehensive Population Health Strategy for Pain.

U.S. Department of Health and Human Services. (2019). Pain Management Best Practices Inter-Agency Task Force Report: Updates, Gaps, Inconsistencies, and Recommendations. Retrieved from U. S. Department of Health and Human Services website: https://www.hhs.gov/ash/advisory-committees/pain/reports/index.html

VA/DoD Clinical Practice Guideline for Opioid Therapy for Chronic Pain: Version 3.0. (2017). Washington DC: Department of Veterans Affairs, Department of Defense.

Von Korff M, Jensen MP, & Karoly P (2000). Assessing global pain severity by self-report in clinical and health services research. Spine, 25(24), 3140–3151. [PubMed: 11124730]

Wang Y-P, & Gorenstein C (2013). Psychometric properties of the Beck Depression Inventory-II: A comprehensive review. Revista Brasileira De Psiquiatria (Sao Paulo, Brazil: 1999), 35(4), 416–431. 10.1590/1516-4446-2012-1048 [PubMed: 24402217]

WHOQOL Group (1998). Development of the World Health Organization WHOQOL-BREF quality of life assessment. Psychol Med 1998; 28: 551–558.

Williams A. C. de C., Eccleston C., & Morley S. (2012). Psychological therapies for the management of chronic pain (excluding headache) in adults. The Cochrane Database of Systematic Reviews, 11, CD007407. 10.1002/14651858.CD007407.pub3 [PubMed: 23152245]

Witkiewitz K, Falk DE, Kranzler HR, Litten RZ, Hallgren KA, O'Malley SS, Anton RF, & Alcohol Clinical Trials Initiative (ACTIVE) Workgroup. (2014). Methods to analyze treatment effects in the presence of missing data for a continuous heavy drinking outcome measure when participants drop out from treatment in alcohol clinical trials. Alcoholism, Clinical and Experimental Research, 38(11), 2826–2834. 10.1111/acer.12543 [PubMed: 25421518]

Yu W, Ravelo A, Wagner TH, Phibbs CS, Bhandari A, Chen S, & Barnett PG (2003). Prevalence and costs of chronic conditions in the VA health care system. Medical Care Research and Review: MCRR, 60(3 Suppl), 146S–167S. 10.1177/1077558703257000 [PubMed: 15095551]

Impact Statement

Clinical guidelines recommend cognitive behavioral therapy (CBT) as a first line treatment for individuals with chronic pain but the availability of trained clinicians remains less than adequate. This evaluation of 1,331 Veterans who initiated CBT-CP treatment as part of the Department of Veterans Affairs National Evidence-Based Psychotherapy Training Program found significant improvements in patient outcomes. There is a need to increase access to evidence-based nonpharmacological approaches for pain management and these findings suggest that the broad dissemination of clinician training in CBT-CP would help improve outcomes for individuals with chronic pain conditions in both the public and private sector.

Table 1

VA Cognitive Behavioral Therapy for Chronic Pain (CBT-CP) Session Information

Session	Content
1	**Interview and Assessment:** Clinical pain evaluation and baseline assessment measures
2	**CBT-CP Orientation:** Pain education and familiarization with the CBT-CP approach to treatment
3	**Assessment Feedback and Goal Planning:** Clinical implications of assessment and development of treatment goals
4	**Exercise and Pacing:** Importance of movement and thoughtful approach to physical activities
5	**Relaxation Training:** Relaxation benefits and techniques
6	**Pleasant Activities 1:** Identification of meaningful and pleasurable activities
7	**Pleasant Activities 2:** Implementation of selected valued activities
8	**Cognitive Coping 1:** Understand automatic negative thoughts and how they impact pain experience
9	**Cognitive Coping 2:** Monitor and challenge automatic thoughts
10	**Sleep:** Strategies for improving sleep despite pain
11	**Discharge Planning:** Plan for flare-ups and review CBT-CP skills
12	**Booster Session:** Review implementation of CBT-CP and troubleshoot issues

Table 2

Patient Demographics (N = 1,331)

Gender	Male	Female	Unknown			
	1084 (81%)	236 (18%)	11 (1%)			
Age	Mean (SD)	Range				
	52.3 (12.4)	21 – 87				
Race	Caucasian/ White	African American/ Black	Other	Unknown		
	923 (69%)	304 (23%)	43 (3%)	61 (5%)		
Ethnicity	Non-Hispanic/Latino	Hispanic/Latino	Unknown			
	796 (60%)	85 (6%)	450 (34%)			
Education	≤ High School Graduate	Some College	College Graduate	Attended/Completed Graduate School	Unknown	
	282 (21%)	324 (24%)	215 (16%)	60 (5%)	450 (34%)	
Service Era	Vietnam	Post-Vietnam	Persian Gulf War	OEF/OIF/OND	Other	Unknown
	175 (13%)	289 (22%)	100 (8%)	323 (24%)	145 (11%)	450 (34%)

Note. OEF/OIF/OND = Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn. Data on ethnicity, education, and service era were not collected in early training cohorts, resulting in some Veterans for which these data are listed as “Unknown.” Some Veterans indicated that they served in multiple eras.

Table 3

Descriptive Statistics for Primary Outcome Measures

Variable	Session 1 Mean (*SD*) (*n* = 1,331)	Session 7 Mean (*SD*) (*n* = 983)	Session 11 Mean (*SD*) (*n* = 775)
Pain NRS			
Worst (past week)	8.51 (1.30)	8.02 (1.64)	7.68 (1.86)
Average (past week)	6.55 (1.64)	6.22 (1.81)	5.78 (1.98)
Least (past week)	4.49 (2.03)	4.33 (2.06)	4.02 (2.18)
Pain Catastrophizing Scale	31.54 (11.81)	25.84 (12.44)	21.71 (12.91)
WHYMPI-INT	4.53 (1.08)	4.13 (1.25)	3.71 (1.36)
Depression			
BDI-II	27.00 (11.48)	22.28 (11.61)	18.82 (10.98)
PHQ-9	15.37 (5.97)	12.78 (6.18)	10.97 (6.31)
WHOQOL			
Physical	32.52 (15.88)	38.96 (17.15)	43.14 (18.50)
Psychological	43.04 (18.21)	48.67 (17.93)	52.02 (18.91)
Social	43.66 (22.14)	47.93 (22.49)	51.32 (23.31)
Environmental	62.47 (16.73)	66.32 (16.59)	68.26 (16.63)

SD = Standard Deviation. NRS = Numerical Rating Scale; WHYMPI-INT West Haven-Yale Multidimensional Pain Inventory – Interference Subscale; BDI-II = Beck Depression Inventory – 2nd Edition; PHQ-9 = Patient Health Questionnaire. WHOQOL = World Health Organization Quality of Life measure.

Table 4

Mixed-Effects Models of Change over Time in Primary Outcome Measures (N = 1,331)

Variable	*Coefficient*	*SE*	*t* (Approximate df)	*p*-value	Cohen's *d*
Pain NRS					
Worst (past week)					
Intercept	8.51	0.04	189.51 (1970)	<.001	
Time	−0.84	0.06	−14.84 (1837)	<.001	0.65
Average (past week)					
Intercept	6.56	0.05	127.06 (1761)	<.001	
Time	−0.70	0.06	−11.91 (1758)	<.001	0.43
Least (past week)					
Intercept	4.50	0.06	74.68 (1654)	<.001	
Time	−0.40	0.06	−6.30 (1717)	<.001	0.20
Pain Catastrophizing Scale					
Intercept	31.55	0.36	88.57 (1513)	<.001	
Time	−9.18	0.34	−27.41 (1762)	<.001	0.78
WHYMPI-INT					
Intercept	4.56	0.04	125.53 (1487)	<.001	
Time	−0.75	0.03	−22.15 (1623)	<.001	0.70
Depression					
BDI-II					
Intercept	27.68	0.98	28.11 (181)	<.001	
Time	−7.52	0.77	−9.76	<.001	0.66
PHQ-9			(221)85.68 (1565)		
Intercept	15.34	0.18	−22.97 (1667)	<.001	
Time	−4.16	0.18		<.001	0.70
WHOQOL					
Physical					
Intercept	32.68	0.49	66.28 (1542)	<.001	
Time	10.29	0.48	21.54 (1669)	<.001	0.65
			80.41 (1467)		
Psychological			18.29 (1639)		
Intercept	43.05	0.54	66.16 (1522)	<.001	
Time	8.78	0.48	11.78 (1653)	<.001	0.48
			128.43 (1463)		
Social			13.12 (1634)		
Intercept	43.63	0.66		<.001	
Time	7.36	0.63		<.001	0.33
Environmental					
Intercept	62.57	0.49		<.001	
Time	5.68	0.43		<.001	0.34

Note. Intercept is the estimated mean initial value for each measure; Time is the estimated mean change in score over the course of treatment. Cohen's *d* was calculated as the slope estimate of change over time divided by the *SD* of the relevant measure at the initial measurement timepoint. Initial, mid-point, and final (sessions 1, 7, and 11) are indicated as times 0, 0.6, and 1.0, respectively, in the mixed effects analyses.

SE = Standard Error. NRS = Numerical Rating Scale; PCS = Pain Catastrophizing Scale; WHYMPI-INT West Haven-Yale Multidimensional Pain Inventory – Interference Subscale; BDI-II = Beck Depression Inventory – 2nd Edition; PHQ-9 = Patient Health Questionnaire.