Implementation of Psychotherapies and Mindfulness-based Stress Reduction for Chronic Pain and Chronic Mental Health Conditions: A Systematic Review

November 2021

Prepared for:

Department of Veterans Affairs
Veterans Health Administration
Health Services Research & Development Service
Washington, DC 20420

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PREFACE

The VA Evidence Synthesis Program (ESP) was established in 2007 to provide timely and accurate syntheses of targeted healthcare topics of importance to clinicians, managers, and policymakers as they work to improve the health and healthcare of Veterans. These reports help:

- Develop clinical policies informed by evidence;
- Implement effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures; and
- Set the direction for future research to address gaps in clinical knowledge.

The program comprises three ESP Centers across the US and a Coordinating Center located in Portland, Oregon. Center Directors are VA clinicians and recognized leaders in the field of evidence synthesis with close ties to the AHRQ Evidence-based Practice Center Program. The Coordinating Center was created to manage program operations, ensure methodological consistency and quality of products, and interface with stakeholders. To ensure responsiveness to the needs of decision-makers, the program is governed by a Steering Committee composed of health system leadership and researchers. The program solicits nominations for review topics several times a year via the program website.

Comments on this evidence report are welcome and can be sent to Nicole Floyd, Deputy Director, ESP Coordinating Center at Nicole.Floyd@va.gov.

Recommended citation: Goldsmith E, Koffel E, Ackland P, Hill J, Landsteiner A, Miller W, Stroebel B, Ullman K, Wilt T, and Duan-Porter W. Implementation of Psychotherapies and Mindfulness-based Stress Reduction for Chronic Pain and Chronic Mental Health Conditions. Washington, DC: Evidence Synthesis Program, Health Services Research and Development Service, Office of Research and Development, Department of Veterans Affairs. VA ESP Project #09-009; 2021.

This report was prepared by the Evidence Synthesis Program Center located at the **Minneapolis VA Medical Center, Minneapolis, MN,** directed by Timothy J. Wilt, MD, MPH and funded by the Department of Veterans Affairs, Veterans Health Administration, Health Services Research and Development.

ACKNOWLEDGMENTS

This topic was developed in response to a nomination by the Pain/Opioid Consortium of Research (CORE), funded by VA Health Services Research and Development (HSR&D). The scope was further developed with input from the topic nominators (ie, Operational Partners), the ESP Coordinating Center, the review team, and the Technical Expert Panel (TEP).

In designing the study questions and methodology at the outset of this report, the ESP consulted several technical and content experts. Broad expertise and perspectives were sought. Divergent and conflicting opinions are common and perceived as healthy scientific discourse that results in a thoughtful, relevant systematic review. Therefore, in the end, study questions, design, methodologic approaches, and/or conclusions do not necessarily represent the views of individual technical and content experts.

The authors gratefully acknowledge the following individuals for their contributions to this project:

Operational Partners

Operational partners are system-level stakeholders who have requested the report to inform decision-making. They recommend TEP participants; assure VA relevance; help develop and approve final project scope and timeframe for completion; provide feedback on draft report; and provide consultation on strategies for dissemination of the report to field and relevant groups.

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The Coordinating Center sought input from external peer reviewers to review the draft report and provide feedback on the objectives, scope, methods used, perception of bias, and omitted evidence. Peer reviewers must disclose any relevant financial or non-financial conflicts of interest. Because of their unique clinical or content expertise, individuals with potential conflicts may be retained. The Coordinating Center and the ESP Center work to balance, manage, or mitigate any potential nonfinancial conflicts of interest identified.

TABLE OF CONTENTS

Preface i

Acknowledgments ii

Executive Summary 1

- Introduction 1
- Methods 2
- Results 4
- Discussion 26

Abbreviations Table 34

Introduction 36

Methods 38

- Topic Development 38
- Key Questions 38
- Search Strategy 38
- Screening and Selection of Eligible Studies 39
- Data Abstraction and Quality Assessment 39
- Data Synthesis 40
- Rating the Body of Evidence 40
- Peer Review 40

Results 43

- Overview of Eligible Articles 43
- CBT, MBSR, and ACT for Chronic Pain: Barriers and Facilitators (KQ 1a) 46
  - Key Results 46
  - Section Overview 46
  - Outer Setting 47
  - Intervention Characteristics 53
  - Other CFIR Domains 55
- CBT for Insomnia, SUD, and OCD: Barriers and Facilitators (KQ 2a) 55
  - Key Results 55
  - Section Overview 56
  - Inner Setting 56
  - Characteristics of Individuals 57

Other CFIR Domains ... 57

CBT for Chronic Pain, Depression, Anxiety, Insomnia, and PTSD, and ACT for Depression: Effects of Implementation Strategies (KQ 1b + KQ 2b) ... 61

Key Results ... 61

Section Overview ... 61

Training/Education, Facilitation, and Audit/Feedback ... 62

Training/Education and Audit/Feedback ... 65

Training/Education ... 65

Access to New Funding ... 65

Trauma-focused Psychotherapies for PTSD—CPT and PE: Barriers, Facilitators, and Effects of Implementation Strategies (KQ 2) ... 68

Key Results ... 68

Section Overview ... 68

Outcomes of VHA National Implementation for CPT and PE ... 69

VHA: New Referral Process and Preparatory Group Sessions ... 70

Barriers and Facilitators in VHA Settings ... 71

Implementation in Non-VA Settings, and Barriers and Facilitators ... 74

CBSST, DBT, MET, and Contingency Management (KQ 2) ... 83

Key Results ... 83

Section Overview ... 83

Barriers and Facilitators for CBSST ... 84

Implementation of MET, CM, and DBT ... 85

Summary and Discussion ... 87

Summary of Key Findings ... 87

Implications for VA Policy ... 90

Research Gaps/Future Research ... 91

Limitations ... 93

Conclusions ... 94

References ... 95

FIGURES AND TABLES

Table 1. Adaptation of the Consolidated Framework for Implementation Research (CFIR): Domains and Subdomains[a] ... 41

Table 2. RE-AIM Framework Domains and Definitions[a] ... 42

Figure 1. Search and Selection of Eligible Articles ... 44

Table 3. Summary of Characteristics for Included Articles ... 45

Table 4. Barriers and Facilitators for Uptake of CBT, MBSR, and ACT for Chronic Pain and Chronic Mental Health Conditions—Results by CFIR Domains ... 58

Table 5. Outcomes for Implementation of CBT and ACT—Results by Implementation Strategies and RE-AIM Categories ... 66

Table 6. Outcomes for Implementation of Trauma-Focused Psychotherapies for PTSD (CPT/ PE)—Results by RE-AIM Categories ... 75

Table 7. Barriers and Facilitators for Uptake of Trauma-Focused Psychotherapies for PTSD (CPT and PE)—Results by CFIR Domains ... 77

Appendix A. Search Strategies ... 106

Appendix B. Eligibility Criteria ... 109

Appendix C. Consolidated Framework for Implementation Research (CFIR) Definitions* ... 110

Appendix D. Adapted Quality Assessment Criteria ... 114

Appendix E. Peer Review Disposition ... 118

Appendix F. Quality Assessment for Eligible Publications ... 127

Appendix G. Evidence Tables ... 134

EXECUTIVE SUMMARY

INTRODUCTION

Chronic pain conditions are common causes of disability in the US and contribute to other disabling conditions, such as opioid use disorder. In 2011-2012, chronic pain affected at least 100 million US adults and cost more than $600 billion in treatment and lost productivity. Chronic pain prevalence has continued to increase, with concomitant higher levels of psychological distress. Chronic pain profoundly impacts physical, mental, and social functioning. Individuals with chronic pain have higher prevalence of mental health conditions, including posttraumatic stress disorder (PTSD), depression, and insomnia; they are also at greater risk for other chronic health conditions. Veterans have a higher prevalence of chronic pain conditions compared to civilians, resulting in significant healthcare costs for the Veterans Health Administration (VHA).

People with chronic pain often receive medical treatments, such as opioids and surgery, that have limited benefit in many circumstances and carry higher risk for adverse events. Nonpharmacologic and noninvasive therapies with demonstrated functional benefits are among the first- and second-line treatments recommended by current guidelines for chronic pain. First-line options include evidence-based psychotherapies (EBPs), exercise, physical therapy, and non-opioid medications. EBPs that have demonstrated efficacy for improving chronic pain outcomes include cognitive behavioral therapy (CBT), acceptance and commitment therapy (ACT), and mindfulness-based stress reduction (MBSR). Because no single therapy is effective for the majority of patients with chronic pain and pain treatment responses are heterogeneous, experts recommend personalized multimodal care—using multiple treatment approaches in a stepped or integrated fashion.

VHA is committed to improving nonpharmacological treatment and reducing opioid-related harms for Veterans with chronic pain. VHA national initiatives have supported implementation of EBPs for chronic pain, including a form of CBT focused on chronic pain treatment (CBT-CP), but critical gaps remain. EBPs are underutilized in VHA clinical settings and are not widely integrated into chronic pain care. To help identify areas of research critical for improving uptake of these therapies, the VA Health Services Research & Development (HSR&D) Pain/Opioid Consortium of Research (CORE) requested an evidence review on barriers, facilitators, and implementation strategies for EBPs in chronic pain. We included CBT, ACT, and MBSR since these EBPs have demonstrated efficacy for improving chronic pain outcomes, are included in treatment guidelines for chronic pain, and are being delivered in VHA settings; therefore implementation research is a logical next step for these therapies. Additionally, because some findings from implementation of EBPs to treat chronic mental health conditions may be applicable to implementation of EBPs for chronic pain, the Pain/Opioid CORE also asked for evidence on barriers, facilitators, and implementation strategies for these other EBPs. This may be especially true for studies conducted within VHA where provider- and system-level barriers, facilitators, and implementation strategies may more readily generalize. Similar to our process with EBPs for chronic pain, we included those EBPs that have a strong evidence base and are included in treatment guidelines for mental health conditions. Selected EBPs are being delivered at VHA facilities to treat common conditions, including insomnia, depression, and PTSD.

We summarize evidence on implementation of EBPs for chronic pain and chronic mental health conditions by 1) barriers and facilitators at the patient, provider, and system levels, and 2) results of various implementation strategies aimed at promoting uptake of and engagement with EBPs. We present qualitative summaries of results for barriers and facilitators, focusing first on CBT, ACT, and MBSR for chronic pain, and then discussing CBT for other conditions, including insomnia and substance use disorders. We also summarize outcomes of implementation strategies for these EBPs, for chronic pain and other conditions. Finally, we present results regarding barriers, facilitators, and effects of implementation strategies for additional EBPs for chronic mental health conditions, including trauma-focused psychotherapies for PTSD.

METHODS

The protocol was registered in PROSPERO: CRD42021252038.

Key Questions (KQ)

KQ1: For cognitive behavioral therapy, acceptance and commitment therapy, and mindfulness-based therapy used to treat adults with **chronic pain**:

a) What are the patient-, provider-, and system-level barriers and facilitators for treatment uptake?
b) What is the effect of implementation strategies to increase uptake of these treatments?

KQ2: For evidence-based psychotherapies and mindfulness-based interventions used in integrated delivery systems to treat adults with **chronic mental health conditions**:

a) What are the provider- and system-level barriers and facilitators to treatment uptake?
b) What is the effect of implementation strategies to increase uptake of these treatments?

Search Strategy

We searched the following databases, from inception through March 2021: MEDLINE, Embase, PsycINFO, and CINAHL. Search terms included MeSH and free text for EBPs (*eg*, CBT, ACT, and MBSR), chronic pain, integrated delivery systems, and Veterans. We sought relevant systematic reviews from the Agency for Healthcare Research and Quality (AHRQ), Evidence-based Practice Center (EPC) reports, and VA Evidence Synthesis Program (ESP) reports; we hand-searched relevant reviews for potentially eligible studies. Our expert advisory panel also provided referrals.

Study Selection

Prespecified eligibility criteria included the following: outpatient treatment of adults with chronic pain or chronic mental health conditions; EBPs used to treat these conditions (*eg*, CBT, ACT, MBSR, Prolonged Exposure Therapy [PE], and Cognitive Processing Therapy [CPT]); examination of barriers and facilitators, and/or evaluation of implementation strategies; and conducted in the United States (US), United Kingdom (UK), Ireland, Canada, or Australia. Exclusion of abstracts required agreement of 2 reviewers. Included abstracts underwent full-text review by 2 individuals, with eligibility decisions requiring consensus.

Data Abstraction and Quality Assessment

Eligible articles underwent independent data abstraction by 2 individuals for the following: participant characteristics and setting (*eg*, country and VHA vs community clinics); EBP; data sources and analytic methods (*eg*, semi-structured interviews and framework analysis, or surveys and multivariate logistic regression); and outcomes. We extracted demographic data in categories consistent with terminology used by authors, including gender and sex. For articles evaluating barriers and facilitators, we classified outcomes by the 5 major domains of the Consolidated Framework for Implementation Research (CFIR): I) Intervention characteristics; II) Outer setting; III) Inner setting; IV) Characteristics of the individuals involved; and V) Process of implementation. For articles evaluating effects of implementation strategies (*eg*, training and education), we categorized outcomes by RE-AIM: Reach (*eg*, uptake by target populations); Effectiveness (*eg*, patient outcomes, cost-effectiveness); Adoption (*eg*, uptake by providers); Implementation (*eg*, consistency and fidelity of intervention delivery); and Maintenance (*eg*, sustainability of effects). We also classified implementation strategies according to the expert recommendations for implementing change (ERIC) projects.

All quantitative results were abstracted by 1 reviewer and over-read by a second reviewer. Qualitative results were independently coded by at least 2 reviewers, with final codes reached by consensus. A priori codes were generated from either CFIR (for barriers and facilitators) or RE-AIM (for evaluation of implementation strategies)**.** We allowed for emergence of new codes if results did not fit well within existing frameworks. We used a best-fit framework synthesis approach to adapt the frameworks; we developed new CFIR subdomains within Outer Setting, to facilitate interpretation of data on barriers and facilitators. For evaluations of implementation strategies, we categorized provider attitudes and self-efficacy within Adoption; these provider factors are important for understanding why some providers will (or will not) use certain EBPs.

Two reviewers independently assessed quality using modified versions of the Newcastle-Ottawa Scale (for quantitative studies) or the Critical Skills Appraisal Programme (CASP) Checklist for qualitative studies. For studies using mixed methods, we used both sets of criteria as applicable. We rated overall quality as high, moderate, or low; consensus was reached through discussion.

Data Synthesis and Analysis

Given heterogeneity in populations, different EBPs, and variable study designs of eligible articles, we did not conduct quantitative meta-analyses. We undertook a qualitative synthesis, focusing first on results for CBT, ACT, and MBSR for chronic pain. We then summarized results related to use of CBT, ACT, and MBSR to treat chronic mental health conditions. Finally, we described results regarding other EBPs, including trauma-focused therapies for PTSD (CPT and PE), Cognitive Behavioral Social Skills Training (CBSST), and Motivational Enhancement Therapy (MET), Contingency Management, and Dialectical Behavioral Therapy (DBT).

To synthesize the evidence, we first created tables with detailed results (classified or coded as described above). We then reviewed these results within categories and across articles addressing the same EBP, to derive themes related to barriers and facilitators and implementation outcomes. We used CFIR for synthesis of barriers and facilitators to implementation and RE-AIM for synthesis of implementation outcomes (with grouping by ERIC strategies).

RESULTS

Overview of Eligible Articles

We screened 7295 unique citations and reviewed the full text of 506 articles. We identified 67 eligible articles—20 that addressed KQ 1, 46 for KQ 2, and 1 applicable to both KQ 1 and 2. Most articles were conducted in the US (n=59), and the vast majority of these were in VHA settings (n=47). Most articles were of high or moderate quality (n=53). Nearly all articles addressing KQ 1 examined only barriers and facilitators (n=20). Only 1 article evaluated outcomes of implementation strategies, specifically the VHA national training program for CBT for chronic pain. Most KQ 1 articles addressed CBT (n=13), while fewer addressed MBSR (n=5) and ACT (n=4). Half of these articles used qualitative methods (n=10), and the remaining used only quantitative techniques (most often questionnaires of randomized controlled trial [RCT] participants or analyses of electronic medical record data). Among articles addressing KQ 2, about half examined only barriers and facilitators (n=22), with the remaining half evaluating implementation strategies (n=25). A third of articles examined CBT for a variety of conditions (n=16), while half addressed trauma-focused therapies for PTSD (CPT and PE, n=25). Remaining articles examined MBSR (n=1), ACT (n=1), CBSST (n=1), DBT (n=2), MET (n=1) and contingency management (n=1). A third of articles used qualitative methods (n=16), with the remaining articles reporting only quantitative results.

First, we describe results for barriers and facilitators for CBT, MBSR, and ACT for chronic pain. We then provide findings for barriers and facilitators for CBT used to treat other conditions (depression, insomnia, substance use disorder [SUD], and obsessive-compulsive disorder [OCD]). Next, we summarize outcomes of implementation strategies for CBT for a variety of conditions, including chronic pain, and ACT for depression. Then we provide results on barriers, facilitators, and effects of implementation strategies for trauma-focused psychotherapies for PTSD—CPT and PE. Finally, we present results for barriers and facilitators and implementation strategies for other EBPs, including CBSST, DBT, MET, and contingency management.

CBT, MBSR, and ACT for Chronic Pain: Barriers and Facilitators (KQ 1a)

Key Results

- All articles assessing CBT for chronic pain involved individual therapy (via telehealth and in person), except 1 cost-effectiveness analysis; all articles assessing MBSR or ACT for chronic pain involved in-person group therapy.
- Barriers to CBT for chronic pain included cultural and communication barriers, mismatch between patient knowledge and beliefs about pain and EBP principles, logistical conflicts for patients, and patient attributes including high pain-related interference.
- Facilitators of CBT for chronic pain included positive patient-therapist dynamics, good match between patient knowledge and beliefs about pain and EBP principles, patient readiness for change, and telehealth availability.
- One article showed that CBT and MBSR for chronic pain were cost-effective for improving quality of life.

- Barriers to MBSR and ACT for chronic pain included mismatch between patient knowledge and beliefs about pain and EBP principles, physical discomfort of being seated for sessions, and logistical conflicts for patients.

- Facilitators of MBSR and ACT for chronic pain settings included positive group dynamics and good match between patient knowledge and beliefs about pain and EBP principles.

We identified 20 eligible articles that addressed barriers and facilitators for uptake of CBT (n=13), MBSR (n=5) and ACT (n=4) for chronic pain; 2 studies addressed more than 1 EBP. Of these 20, half reported only quantitative results, 8 used only qualitative methods, and 2 used mixed methods. All were rated moderate or high quality except for one. The majority were conducted in the US (n=14; 6 in VHA), with the remaining 6 conducted in the UK (n=4), Ireland (n=1), and Australia (n=1). Most articles assessing barriers and facilitators for CBT (n=9), and all of those for ACT, were conducted within effectiveness RCTs. In contrast, MBSR was evaluated in clinical practice settings (n=4), with the exception of 1 cost-effectiveness analysis.

Among the eligible articles examining barriers and facilitators, the majority (n=18) evaluated patient perspectives and experience of EBPs for chronic pain. Results mainly addressed the CFIR domain of Outer Setting (n=19), including subdomains we developed to adapt the CFIR framework for best fit to the data: Patient Knowledge and Beliefs (*ie*, individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention) and Other Patient Attributes (broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, priorities, competence, capacity, learning style, and other patient characteristics that do not fit under other patient-related domains). We added these new subdomains, along with others, to describe themes that were not captured by existing CFIR domains and subdomains. Several qualitative articles (n=10) and 1 cost-effectiveness analysis also addressed the domain of Intervention Characteristics, including new subdomains we developed to better describe identified results: Group Dynamics (*ie*, interactions during group therapy between participants or with facilitators that impacted patient experience and/or outcomes); and Patient-Therapist Dynamics (*ie*, interactions during individual therapy that impacted patient experience and/or outcomes).

Outer Setting

Patient needs and resources

Nine articles reported results addressing this subdomain for CBT (n=4), MBSR (n=4), and ACT (n=1).

Two articles reported interview results from participants in telephone CBT (tCBT) programs, While patients found that telephone delivery helped overcome barriers of geography and time, some also felt that tCBT delivery limited the depth of the patient-therapist relationship. One study interviewed patients participating in group CBT, finding that patients couldn't use pacing skills when at home amid daily tasks. Another study interviewed general practitioners (GPs) regarding chronic pain care for their South Asian patients; GPs felt that unaddressed needs were often psychosocial, that CBT would be helpful, and that culturally specific care and therapy in the patient's own language would be important.

Participants in group MBSR studies found that other time commitments and responsibilities were an obstacle to participation. In one 4-session group MBSR intervention, 59% of participants would have preferred more than 4 sessions, and 73% thought 90-minute sessions were just right. This group's short format helped patients fit the program into their schedules, but some found the duration too short to allow group bonding or to build mindfulness skills. While many group MBSR participants found that pain associated with lengthy seated meditation made groups harder to tolerate, some observed that participating despite discomfort helped them feel capable of doing activities despite pain.

One analysis of interviews with group ACT participants found that the sessions were cognitively, emotionally, and physically demanding, which limited sustained engagement and attendance.

Patient knowledge and beliefs

To facilitate meaningful distinctions that best fit the data, we divided this subdomain into 2 major themes: pain knowledge and beliefs, and therapy knowledge and beliefs.

Pain knowledge and beliefs

Four studies reported patients' pain-related knowledge and beliefs as barriers or facilitators for CBT (n=2) and ACT (n=2).

Some tCBT participants demonstrated a lack of understanding about pain triggers, which they believed related to a lack of clinical consensus on causes of chronic pain, They saw pain as physical and as a natural warning system responding to stress or dysfunction, and did not perceive control over pain episodes' beginning or end or over future events happening. As they saw no clear relationship between their own behavior and the onset of pain, it was rare prior to the intervention for them to engage in pre-emptive adjustment or pacing. For some, cognitive reflection enhanced their understanding of pain triggers and helped them shift emphasis from reactive to proactive pain management strategies. Participants who attributed improvements in pain or pain management to tCBT reported higher self-awareness and self-management of symptoms and evidence of cognitive restructuring.

Some group ACT participants found that fear of causing damage to themselves limited their ability to engage in acceptance, which is a core process of ACT. Belief that a specific pain diagnosis or cure could be found was also a barrier to acceptance, while believing there was no specific cure facilitated acceptance. Identifying psychological factors in pain expression helped give patients confidence to become more active and decatastrophize the impact of pain on their thinking and mood.

Therapy knowledge and beliefs

Fourteen articles reported patients' therapy-related knowledge and beliefs as barriers or facilitators for CBT (n=8), ACT (n=3) and MBSR (n=3).

Some tCBT participants initially felt that CBT questions the validity of pain experience or implies that chronic pain was due to a character weakness needing correction. In another tCBT intervention, about a third of participants were skeptical that talking could affect their physical conception of pain. Patients who had received CBT believed some people with chronic pain will be resistant to the idea that counseling may help prevent or manage chronic pain and recommended clear information at screening about CBT principles, including the link between physical pain symptoms and ways of thinking. Some group CBT participants felt that a group program can't suit individuals' complex pain experiences.

An analysis of group CBT for pain and insomnia found that higher Treatment Acceptability (treatment made sense, is acceptable, is suitable, is expected to be effective) predicted higher treatment session attendance (ß .20, $p<0.05$). Participants who eventually dropped out of another group CBT intervention recalled prior session material less accurately (effect size not reported (NR), $p<0.01$), recalled current material less accurately just after a session (effect size NR; $p<0.01$), and performed more poorly on homework (effect size NR; $p<0.05$) than completers.

In 1 tCBT program, about a fifth of participants had a good understanding of CBT approaches based on prior CBT experience (for other health conditions), reading, or their own professions, and many participants saw tCBT as a non-invasive, low-risk, "nothing to lose" alternative to medication. Some, however, felt tCBT was not effective for them because they were already using CBT-informed pain management strategies prior to the intervention. Participants thought tCBT would be most helpful for people with little or no prior experience of CBT for pain and recommended pre-intervention screening for CBT experience. In another study of people who had participated in group CBT for pain in the past, CBT methods continued to provide a framework to facilitate positive change for some participants, while for others the concepts could not be adopted or maintained beyond the program. Continuity appeared to be related to individuals' readiness to adopt cognitive behavioral beliefs and attitudes about pain. Some saw shifting focus from pain to self-management as a valuable way of managing their pain, while others thought it to be counterproductive. Some participants thought CBT techniques felt like "brainwashing" and reinforcement seemed unnecessary.

Three articles reported patients' readiness for change as barriers or facilitators for CBT. Two analyses of the same study data assessed roles of constructs comprising the Pain Stages of Change Questionnaire (PSOCQ) in relation to CBT adherence in a primary care setting. In 1 analysis, higher Precontemplation, representing lower perceived personal responsibility for pain control and interest in pain-related behavior changes, was negatively associated with CBT adherence (% unique variance -0.301, $p<0.05$). Higher Contemplation, representing increasing awareness of personal responsibility for pain control and interest in pain-related behavior changes, was positively associated with CBT adherence (% unique variance 0.370, $p<0.05$). Self-efficacy was not meaningfully or significantly predictive of adherence. In another analysis of the same study data, higher increase in a change score combining Action (acceptance of a self-management approach to chronic pain and engagement in efforts to improve pain management skills) and Maintenance (established self-management perspective and desire to continue learning and applying pain management skills) subscales was positively correlated with higher CBT adherence (0.34, $p <.05$). A foundational study of different data preceding these analyses observed that for CBT completers versus non-completers, pre-treatment mean scores were significantly lower for Precontemplation (2.93 vs 3.27, $p<0.05$) and higher for Contemplation (3.84 vs 3.61, $p<0.05$), and did not differ on Action or Maintenance scores.

Some group ACT participants found the approach abstract and difficult to grasp, and couldn't see relevance to their pain experience. Some participants in 1 group ACT program saw acceptance of present pain and limitations, while committing to keeping as active and mobile as

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possible, as key to self-management. They felt these skills were acquired from the program, along with the ability to use pacing skills to set consistent, realistic goals and the development of mindfulness strategies to train attention to the present moment. Other group ACT participants developed a focus on creating openness to the possibility that pain does not have to stop one from doing things and that one can set objectives based on one's values. In another group ACT program, participants eventually saw acceptance as the acknowledgement of the presence of pain alongside the belief that life could still be lived despite pain. Some participants had initial strong emotional reactions, including anger and resistance, to the word "acceptance". Acceptance was associated with "giving up" for 1 patient. Some moved from this resistance of acceptance toward a sense of expanded possibilities, associated with changes in both mindset and behaviors (*eg,* overcoming fear of increasing pain to engage in more exercise). While some found mindfulness to be of benefit, as it assisted with processing emotions and letting them pass, others felt they "didn't get it".

Some group MBSR participants wanted more focus on chronic pain, including how to control pain and how to decrease medications. Some wanted more information on anxiety, pain, and the mind-body connection, and some wanted more physical movement incorporated. Participants in 1 group MBSR program found techniques including breathing, pausing, counting, and slowing down useful for relaxation and relieving pain, and were able to apply them with benefits beyond the practice time. For participants in another group MBSR program, insufficient or inaccurate information about MBSR led some patients to believe that it would not be valuable; it was seen as "for people whose problems were in their head". Some participants in this program found difficulty understanding the purpose of MBSR practices to be an obstacle. Some found the body scan practice problematic, as it identified more sites or types of pain, and seemed counter to their past impressions about pain or avoidance strategies. Some group MBSR participants were afraid that meditation in one position would not be helpful and would end up causing more pain, even if they believed this couldn't be the motivation for the intervention.

Other patient attributes

To facilitate meaningful distinctions that best fit the data, we divided this subdomain into 5 categories: pain characteristics, pain treatments, values, religion, and age and other demographics.

Pain characteristics

Eight articles examined the impact of pain characteristics in uptake and attendance of CBT (n=7) and ACT (n=1). Higher pain interference was associated with incomplete attendance of pain psychotherapies in 3 studies. Non-completers of one-on-one CBT reported more baseline pain-related interference than completers in 1 study (mean West Haven–Yale Multidimensional Pain Inventory (WHYMPI-INT) 5.33 vs 4.64, p<0.01), but did not differ on pain severity, Global Pain Rating, pain-related disability, pain duration, state anxiety, or depressive symptoms. In another study, one-on-one CBT completion was more likely among participants with lower baseline pain-related interference per WHYMPI-INT (OR 1.19, [95%CI 1.06, 1.34]), but completers and non-completers did not differ significantly on baseline pain severity, pain catastrophizing, depression severity, or quality of life measures. Higher baseline pain interference (Brief Pain Inventory [BPI-I]) was associated with less frequent attendance of a group MBSR program (r -.357, p=0.045).

In another group CBT study, as compared to people who attended at least 1 group CBT session, people who were eligible but attended no sessions had higher pre-treatment Pain Catastrophizing Scale scores (mean 38.9 vs 30.3, $p<0.01$) but did not differ on BPI-I, Roland-Morris Disability Scale (RMDS), Center of Epidemiological Studies Depression Scale (CESD), or quality of life (QOL). Completers did not differ from non-completers on any of these measures.

In another one-on-one CBT study, completers and non-completers did not differ significantly on pain interference, or on pain severity, pain-related disability, pain behavior, pain duration, activity level, or depressive symptom severity. In a different one-on-one CBT study, participants who did or did not receive an adequate CBT dose did not differ significantly in pain intensity. In a one-on-one study of CBT for pain and insomnia, completers and non-completers did not differ significantly on several functional pain measures, pain catastrophizing, kinesiophobia, or on measures of anxiety, depression, insomnia, or objectively measured sleep.

Participants in 1 telephone CBT program believed tCBT is most likely to be acceptable to people with presenting symptoms of musculoskeletal pain, and to people with low to moderate pain rather than severe pain.

Group ACT participants who did not attend an adequate number of sessions did not differ significantly from attendees on primary pain location, pain-related disability, pain intensity, pain acceptance, acceptance, or quality of life measures.

Pain treatments

Five articles reported patients' other pain treatments as barriers or facilitators for CBT (n=4) and ACT (n=1). An analysis of group CBT for pain and insomnia found that opioid medication use at baseline predicted lower treatment session attendance (ß .21, $p<0.05$), but that current use of medication types including hypnotics, opioids, and non-opioid analgesics was unrelated to attendance. Non-completers of one-on-one CBT did not differ from completers on pain medication use or history of pain surgery. Non-completers of another one-on-one CBT intervention did not differ from completers on number of medical outpatient visits for pain, number of medical inpatient visits for pain, number of psychiatric visits, number of visits to other pain care providers, percentage of participants using prescribed or over-the counter pain medications, or percentage of participants receiving disability for pain. Many participants in 1 group ACT trial had experienced other interventions of multiple types that hadn't helped, and felt this made them willing to try anything that might help.

Values

Some participants in 1 group ACT program noted that knowing their pain burdened family members was a motivation to get better. Social interaction through re-engagement in valued activities helped participants become aware of the need to look after their own needs as well as others'. Some could identify their values, but were not ready to move toward values-based action, and continued to avoid experiences perceived to involve pain or discomfort.

Religion

Referring providers for 1 group MBSR intervention were reportedly concerned that MBSR would not be a good fit for patients with strong religious beliefs, but many participants reported that this was not an issue, and most did not perceive any relationship between MBSR and their religion/spirituality.

Age and other demographics

Ten articles addressed age and other demographics as barriers or facilitators for CBT (n=8), ACT (n=2), and MBSR (n=1). Completers of CBT for chronic pain in national VHA practice were more likely to be older (OR for 1 year 1.01, 95% CI 1.002-1.023), but did not differ significantly from non-completers on gender, race, ethnicity, education level, or military service era. As compared to people who completed a group CBT session focused on low literacy rural people with chronic pain, non-completers had lower mean income (under vs over $13,000 annually, p<0.01) and fewer years of education (mean 11.8 vs 13.1, p<0.02), and did not differ significantly on achievement testing, age, or miles traveled to reach session sites. An analysis of group CBT for pain and insomnia found that completers did not differ significantly from non-completers on age, sex, race, marital status, or education level. Studies of one-on-one CBT completers and non-completers within RCTs found that they did not differ significantly in age, sex (or gender, or percent male), race/ethnicity, years of education, living alone versus with others, employment status, retirement status, relationship status, or service connection.

In a study of group ACT and group CBT, there was no significant difference across age groups in dropout percentage, number of sessions attended, treatment credibility, treatment satisfaction, or expectations of improvement with treatment. In a group ACT program, participants who did not attend an adequate number of sessions did not differ significantly from attenders on age, years of education, gender, ethnicity, employment status, marital status, or number of medical comorbidities. Some group ACT participants felt that older participants might be less open to the psychological orientation of the intervention. Attendance of 1 group MBSR program was not predicted by age, gender, ethnicity, living alone, or having a pre-existing relationship with the research team.

Sex, gender, race, and ethnicity were not defined in any included articles, either conceptually or in terms of data collection processes, and the accuracy of these terms as descriptors of analyzed data could not be confirmed.

Intervention Characteristics

Evidence strength and quality

One study reported that GPs in community UK practice were interested in culturally relevant CBT to help their South Asian patients with chronic pain. Study authors noted that most CBT clinical evidence comes from studies with people of European descent.

Design quality and packaging

Five articles reported design quality and packaging as barriers or facilitators for CBT (n=2) and MBSR (n=3).

Participants in a telephone CBT intervention found that the self-management therapy materials provided to them for home use had useful functions as a memory aid for advice during sessions, a way to prompt and motivate daily goals, and a notebook for thoughts to discuss with their therapist at the next session. Therapy materials helped participants understand mind-body connections and principles of CBT and helped identify pain triggers in order to identify solutions. However, some participants found therapy materials repetitive, difficult to navigate, and too rigid as compared to the personalized and adaptable therapist approach, and thought the purpose and role of therapy materials in relation to therapist sessions was not clear enough at the outset. Participants in another telephone CBT intervention disliked therapy materials' case studies and lifestyle scenarios focused on inactive, isolated people, as these represented potential identity loss that they wanted to avoid. Participants in a group MBSR intervention found that recordings and handouts helped them set up and adapt their mindfulness routines at home. Participants in another group MBSR intervention found that recordings of training sessions were helpful for viewing at an alternate time and that weekly messages encouraged mindfulness. Participants of third group MBSR intervention wanted MBSR to be held in a space that was quiet, uncrowded, and consistent.

Cost

A cost-effectiveness study of group MBSR and group CBT versus usual care (UC) for chronic back pain found both MBSR and CBT to be cost-effective for increasing quality of life. The mean 1-year per-participant cost to society for MBSR was $724 lower than UC (95% CI -$4386, $2778), and the mean 1-year per-participant healthcare cost to the payer was $982 lower than UC (-$4108, $1301). MBSR yielded a quality-adjusted life years (QALY) gain of 0.034 (0.008, 0.060) and had a 90% probability of costing <$50,000/QALY (the cost-effectiveness threshold) in societal cost-QALY bootstrap analyses. The mean 1-year per-participant cost to society for CBT was $125 higher than UC (95% CI -$4103, $4347), and the mean 1-year per-participant healthcare cost to the payer for CBT was $495 higher than UC (-$2741, $3550), yielding a QALY gain of 0.041 (0.015, 0.067). The incremental cost-effectiveness ratio for CBT over UC was $3049/QALY, far below the $50,000/QALY threshold for cost-effectiveness, and CBT had an 81% probability of costing <$50,000/QALY in bootstrap analyses. Back pain-related healthcare costs showed the same pattern as seen in overall healthcare costs: a trend toward increase in healthcare costs over UC for CBT and a trend toward reduction for MBSR. Both CBT and MBSR trended toward reducing non-back related healthcare costs compared to UC. There were no significant differences between MBSR and UC, between CBT and UC, or between MBSR and CBT in patient copay amounts or in total societal costs. There were no significant differences between MBSR and UC, or between CBT and UC, in health care utilization or productivity losses.

Group dynamics

Six articles addressed group dynamics as barriers or facilitators for ACT (n=3) and MBSR (n=3). No CBT interventions in included studies had a group format.

Participants in group ACT interventions appreciated the ability to express emotions freely in a non-judgmental atmosphere, felt solidarity with other chronic pain patients, and felt empathy and validation from the group. The group enabled participants to share best ways of managing pain, and helped participants identify non-coping areas. Comparison with others in the group helped participants reframe their pain-related challenges and increased motivation to cope with pain. Hearing others' perspectives within the group facilitated some participants' identification of values and subsequent values-based action. Participants valued the group facilitators' relaxed, non-judgmental, and understanding attitudes, and facilitators' use of techniques and adaptations to help the group understand and apply concepts.

Participants in group MBSR interventions also appreciated group social support, felt less isolated in their pain experience, and valued the ability to talk with people with similar experiences. Sharing with the group also helped participants feel better about their challenges in learning mindfulness. Some, however, felt the group detracted from their experience and would have preferred a one-on-one format for MBSR. Mixed-gender groups were difficult for some women with histories of sexual assault, and women-only group options were suggested. While some participants felt the facilitator would ask them to be quiet too often and would have preferred more conversation with group members who had similar experiences, others were frustrated by other group members discussing topics they viewed as irrelevant and appreciated when facilitators could structure and control the group. Some felt teachers' unfamiliarity with participants' culture, such as military service, made them reluctant to provide limits and accountability in group discussion. Many patients were able to minimize pain and accommodate disabilities by making adjustments to standard seated meditation. Sometimes the MBSR teacher aided in this process; at other times participants felt the instructors needed to be more flexible about meditation positions.

Patient-therapist dynamics

Participants in tCBT thought that direct interaction with therapists enabled them to compare daily routines and activity levels against social norms and identify self-care opportunities. Patients appreciated having someone to share their pain experience with, which made the experience less isolating, and felt that tCBT was an opportunity to be heard, as opposed to GP care. Therapists were viewed as friendly, knowledgeable, empathic, and able to quickly establish rapport; speaking to the same therapist each session felt consistent, reliable, and convenient.

Other CFIR Domains

Additional results from 1 article addressed Inner Setting, Readiness for Implementation—Available Resources, and Characteristics of Individuals, Knowledge, and Beliefs. GPs in a UK community practice noted that there are not enough trained counsellors with South Asian language skills and relevant cultural understanding to provide culturally informed CBT. GPs also noted they had limited understanding of what CBT approaches existed and were available. They had some understanding of how CBT could help pain, but felt current provision was limited, inadequate, and culturally inappropriate for some South Asian patients.

CBT for Insomnia, SUD, and OCD: Barriers and Facilitators (KQ 2a)

Key Results

- Barriers in VHA and non-VA settings included:
    - Deficits in resources including lack of protected time to deliver treatment, lack of training of referring providers, no centralized source for educational information, and limited availability of trained providers
    - Lack of provider knowledge about EBPs

  - Patient factors related to comorbid mental health conditions, cognitive barriers to understanding CBT concepts, cultural/language barriers, transportation barriers

- Facilitators in VHA and non-VA settings included:
  - Scalability and convenience of CBT tools and resources
  - Local champions and leadership support
  - Strong networks/communication across clinics and teams

Among evidence addressing provider- and system-level barriers and facilitators to uptake of EBP for chronic mental health conditions, we identified 5 eligible articles on CBT for insomnia (n=3), SUD (n=1), and OCD (n=1). The 3 articles on CBT for insomnia (CBT-I) addressed persistent barriers and facilitators approximately 10 years after VHA national training initiatives for CBT-I were first launched. One article reported interview, focus group, and survey results from general practice and mental health providers in Australia regarding barriers and facilitators to CBT for OCD. One article reported interview results from mental health providers in US community-based addiction treatment organizations regarding barriers and facilitators to CBT for SUD. Results mainly addressed domains of Inner Setting (Readiness for Implementation—Available Resources) and Characteristics of Individuals (Knowledge and Beliefs about the Intervention).

Inner Setting

All 5 articles addressed Readiness for Implementation; specifically, Available Resources were reported as barriers or facilitators to implementation of CBT. One reported Primary Care Providers (PCPs) were satisfied with local resources for CBT-I but the other studies indicated there were deficits in resources related to time, training, educational information, and availability of providers. Two articles addressed Access to Knowledge and Information; for example, 1 article indicated that PCPs "expressed the desire for a more centralized resource to learn about CBT-I and make referrals". One article addressed Leadership Engagement, indicating that local champions and leadership support were key.

One article addressed Implementation Climate—Relative Priority stating, "The general consensus among physicians was that sleep took a 'backseat priority' in complex patients and was not prioritized by patients or providers."

One article addressed Networks and Communication, finding that strong connections between primary care clinics, Primary Care Mental Health Integration (PCMHI) teams, and sleep medicine clinics were important for utilization of CBT-I. One article addressed Provider Decision-making, with PCPs stating that they "secretly hope[d]" that PCMHI would address underlying mental health issues, in addition to the referral reason. One article addressed Patient-Provider Relationships, finding that patients were more willing to engage when they had established relationship with the PCP making referral.

Characteristics of Individuals

All 5 articles identified provider factors in the subdomain Knowledge and Beliefs about the Intervention as barriers or facilitators to implementation of CBT. Additionally, both patients and providers emphasized the importance of provider knowledge about CBT, including PCPs. For example, patients noted that “providers need to be informed about CBT-I to answer patient questions and facilitate referrals” and psychologists “stressed importance of GP support in ongoing care and management of people with OCD”. A quantitative study of PCPs reported that most knew about CBT-I but a small percentage had never heard of it.

Other CFIR Domains

Two articles addressed Intervention Characteristics, finding that providers appreciated the scalability and convenience of CBT in primary care settings and patients appreciated multiple therapeutic tools and resources across different settings (*eg*, accessing workbooks at home and electronic applications when travelling). Two articles reported results pertaining to Outer Setting; 1 of these indicated that cultural/language barriers and transportation challenges led to poor attendance. This study also identified cognitive barriers to understanding CBT concepts, and comorbid mental health conditions (*eg*, anti-social personality disorder). The other article found hesitancy to commit to provider-delivered CBT among patients without a history of mental health treatment.

CBT for Chronic Pain, Depression, Anxiety, Insomnia, and PTSD, and ACT for Depression: Effects of Implementation Strategies (KQ 1b + KQ 2b)

Key Results

- EBPs demonstrated large effects on symptom reduction and improvements in quality of life.
- Over 80% of mental health providers completed VHA national trainings, but it is unclear if trainings increased reach and adoption (*eg*, uptake by target patient populations and use by relevant clinical staff, proportion or representativeness of settings and staff).
- Increased provider self-efficacy and improved perceptions of EBP after VHA training programs.
- It is unclear if there is added benefit for external facilitation.
- Findings related to maintenance of EBPs following VHA training initiatives (*ie*, after consultation phase) were modest, with continued barriers including competing professional time demands and patient barriers (*eg*, distance from clinic, missed appointments).

Among 13 articles addressing implementation of CBT and ACT, nearly half evaluated VHA national initiatives to implement these therapies (n=5). Conditions treated by CBT included chronic pain (n=1), depression and/or anxiety (n=7), insomnia (n=2), and PTSD (n=1).

Implementation Strategies Evaluated

We identified 4 distinct groups of implementation interventions: 1) training/education, facilitation, and audit/feedback, 2) training/education and audit/feedback, 3) training/education, and 4) access to new funding.

We classified the implementation strategies employed in VHA implementation of CBT and ACT as training/education, facilitation, and audit/feedback. We applied ERIC definitions, where training/education involves provider educational resources and activities, facilitation is interactive support provided by internal or external individuals (*eg*, centralized VHA training initiatives to provide resources and support to individual sites), and audit/feedback is collection and summary of clinical performance data given to administrators or clinicians to modify behaviors and enhance fidelity (*eg*, fidelity measures, recommendations during consultation). VHA implementation of CBT and ACT involved structured programs of in-person workshops (2-3 days) followed by 6 months of weekly consultation with experts. For their consultation sessions, trainees were required to submit audio-recordings of therapy sessions with patients, which were rated for fidelity. VHA provided facilitation through centralized resources and support.

In addition to VHA national training initiatives, we classified 3 other articles as evaluating the combination of training/education, facilitation, and audit/feedback. These were also VHA programs, but were not part of the VHA national implementation initiatives. Two articles reported on the same VHA study evaluating pre-post outcomes following regional implementation of CBT for depression. This program included a 1½-day CBT workshop and biweekly follow-up group consultation calls for trainees over 12 weeks. In addition, 12 therapists at 10 sites were randomly assigned to receive external facilitation. The facilitator met with trainees at least monthly for 6 months after the workshop to discuss setting individual goals for CBT implementation, attempting CBT quickly, and reinforcing all efforts to get started. Later calls focused on maintaining motivation and overcoming barriers to achieving individual goals. In addition to scheduled calls, the facilitator received and responded to individual questions and sent email announcements and reminders to the group.

The third article reported a pre-post VHA pilot study implementing brief CBT in primary care for depression and anxiety. Mental health providers were given access to an online training program to complete at their own pace, expected to take approximately 8 hours. Expert clinicians audited patient session audio recordings and provided written and/or verbal feedback regularly, with 2 to 4 randomly extracted session recordings reviewed in 4- to 6-month intervals. External facilitators (*ie*, members of the project staff) regularly engaged study clinicians and clinic leadership through regular group meetings and email. Internal facilitators (*ie*, local directions of Primary Care Mental Health Integration [PCMHI]) addressed site-specific clinician and system concerns collaboratively with external facilitators.

Two articles evaluated the use of training/education and audit/feedback, but did not explicitly state the use of internal or external facilitation and were not a part of VHA national initiatives. One article evaluated training US community addiction counselors to deliver group CBT for depression; counselors received 2 days of didactic training and weekly group supervision over 2.5 years, including review of audiotapes and feedback to improve adherence. The other study trained providers on CBT skills for treating PTSD patients, using 3 internet-based training modules combined with weekly consultations via telephone for 6 weeks.

Finally, 1 study evaluated only online training/education for CBT for depression for VHA SUD program counselors, and another examined access to new funding to facilitate implementation of mental health treatments at primary care sites. The latter study involved 2 primary care demonstration sites for the Improving Access to Psychological Therapies (IAPT) initiative of the UK National Health Service (NHS).

Training/Education, Facilitation, and Audit/Feedback

Eight articles evaluated VHA training programs for CBT (n=7) and ACT (n=1), using survey data from trainees and those who completed training, and information about patients treated by providers who were trained by these programs. Evaluation of CBT-CP involved 71 trained mental health providers across VHA facilities (48 psychologists, 19 social workers, and 4 nurses); of these, 84.5% (n = 60) met all training program requirements. Evaluation of the national training program for CBT for depression involved 221 therapists who participated in workshops and consultation; 82% (n = 182) met all training program requirements. Evaluation of the national training program for CBT-I reported data from 207 trained therapists across 6 cohorts, with 93% (n = 193) having met all training program requirements. For national implementation of ACT for depression, 391 therapists were trained, with 85% (n = 334) completing training program requirements. The regional implementations of CBT for depression involved 28 mental health providers in 1 study, and 9 PCMHI providers in the other (4 completed all training modules). Reported outcomes addressed Effectiveness, Adoption, Implementation, and Maintenance. No articles in this classification group reported on Reach.

Effectiveness

For patients treated with CBT-CP, there was a large reduction of pain catastrophizing (Cohen’s d = 0.81); moderate reductions in pain interference (Cohen’s d = 0.57) and depression (Cohen’s d = 0.53), and moderate improvement in quality of life (Cohen’s d = 0.45); and a small reduction in pain intensity (Cohen’s d = 0.22 to 0.26). For patients who received CBT for depression, CBT-I, or ACT for depression, there were moderate to large reductions in depression, and variable improvement in quality of life. Patients who were treated with CBT-I also had large reductions in insomnia symptoms.

Adoption

We categorized reported outcomes regarding provider attitudes and self-efficacy as Adoption. Providers who participated in national training programs for CBT for depression, CBT-I, and ACT for depression had improvements in both general psychotherapy self-efficacy and EBP-specific self-efficacy, especially post-consultation. Additionally, providers had increases in positive attitudes toward EBPs post-training. In the evaluation of a regional training program for CBT for depression, therapists who received facilitation had a mean increase of 19% in self-reported CBT use from baseline (vs control mean increase of 4%), but this was not statistically significant. There was also no added benefit for facilitation in terms of CBT-specific knowledge, skill, or ability at 3 months post-workshop, when compared with those who did not receive facilitation.

Implementation

Five articles reported on implementation fidelity, as assessed by review of audio-recorded patient sessions. Providers trained in CBT-CP and CBT-I showed higher ratings on competency for the second patients they treated, compared with the first patients. Providers also had increased competency ratings for CBT, comparing later sessions to initial ones for their first treated patients. The study for ACT for depression found that the proportion of therapists who achieved competencies during the initial, middle, and later phase of training were 21%, 68%, and 96%, respectively. In evaluating the fidelity of brief CBT for depression and anxiety, the majority of audio-recorded sessions were rated acceptable for treatment adherence and skillfulness.

The evaluation of regional training for CBT for depression reported that total cost for personnel time (facilitator and 12 therapists) was $2,458.80 over 7 months. Regarding barriers to using CBT, qualitative interviews identified 4 common themes: lack of control over the clinic schedule; rejection of CBT due to difficulty and inflexibility; therapist duties; and poor communication between therapists and clinical leadership.

Maintenance

In surveys 6 months post-training, providers reported using CBT for chronic pain with two-thirds of the patients they treated, and three-quarters indicated they adhered to the protocol, including use of outcome measures to assess progress. Providers agreed that CBT for chronic pain was effective, were likely to recommend it to Veterans, and reported that their treatment approach had changed more towards a CBT model. Similarly, provider surveys 6 months post-training for CBT-I showed that 74% had used CBT-I during the previous month, with mean of 3.4 (standard deviation [SD] 5.3) patients seen per provider. The most common challenges to continued use of CBT-I were competing professional demands and patient factors (*eg*, no-shows and patients' distance from clinic).

Evaluation of national training program for CBT for depression included provider surveys 3-12 months post-training, and found a mean of 19 (SD 22.3, range 0–140) patients were treated since completion of training. Additionally, surveys of providers 3-12 months post-training for ACT for depression showed they were using ACT with approximately 39% of the patients they treated with depression in the month prior. However, given the wide range in duration post-training for both studies, it is unclear whether there was sustained use of CBT or ACT for depression by providers.

Training/Education and Audit/Feedback

Of the 2 studies using training/education and audit/feedback, 1 evaluated outcomes for implementing group CBT for depression in non-VA community addiction programs. For 5 trained addiction counselors, implementation fidelity was assessed using ratings of audio-recorded sessions; the average adherence rate was 94% across all coded sessions and the average competence score across all coded sessions was 4.1, which was satisfactory. For reach, survey data from patients who received CBT indicated positive experiences and perceptions of group CBT. For example, 86% indicated that they "strongly agree" they could use information from the group in their daily life, and 83% reported exercises conducted in the group were helpful.

The other study involved 139 VHA mental health providers who were randomized to training in CBT skills for treating PTSD (n=46 internet modules only, n=42 internet modules and weekly consultation) or no training (n=51). In surveys of provider knowledge and self-efficacy, providers in either training arm had greater increases post-training compared with no training group. Improved motivation enhancement and behavioral task assessment skills, as assessed using standardized patient encounters, were also noted for both training arms, with stronger effects for those who had internet modules and consultation.

Other Studies: Training/Education and Access to New Funding

Eight volunteer counselors (at 7 VHA SUD programs) completed online training for CBT for depression. They reported concerns regarding implementation resource barriers: "I'm going to have to do the group [alone]… I don't think I'm going to have a co-facilitator." Additionally, counselors indicated they would adapt group CBT such that patients could be admitted on an open basis. With regard to reach, counselors indicated concerns about patient needs and that complexity of clinical presentation necessitated resources beyond standard CBT.

The other study evaluated outcomes at 2 primary care demonstration sites for IAPT (UK NHS initiative), but only 1 of these sites delivered in-person CBT for depression or anxiety to a majority of referred patients (Newham); the other site provided mostly self-guided resources. For reach at the Newham site, 24% of referred patients (249 of 1043) attended at least 2 sessions; there were more black individuals among self-referrals for CBT (22%), compared with those referred by GPs (16%). Regarding effectiveness, the study found significant improvements in depression (Cohen's d = 1.06) and anxiety (Cohen's d=1.26) from initial assessment to last available session for patients who had at least 2 sessions.

Trauma-Focused Psychotherapies for PTSD—CPT and PE: Barriers, Facilitators, and Effects of Implementation Strategies (KQ 2)

Key Results

- VHA national training programs improved provider perceptions about and self-efficacy for CPT/PE, but persistent barriers in VHA settings limited reach and adoption.
- Barriers in VHA settings included:
    - Inflexibility and lack of adaptability of CPT/PE protocols
    - Provider workload and scheduling challenges
    - Complexity, comorbidities, and other competing needs of Veterans in VHA
    - Complex referral processes that were burdensome and appeared redundant to patients
    - Patients' (and their social networks') negative perceptions about VHA care, whether due to direct experience or media reports
- Facilitators in VHA settings included:
    - Strong VHA support for training
    - Perceived effectiveness of CPT/PE for patient outcomes
    - Perceived benefits for clinic scheduling and provider morale

  - Patients' positive experiences and relationships with providers in general and those who made referrals for treatments

- In non-VA community settings, mental health providers generally had low concern for barriers and thought that CPT/PE were compatible with their current work, but few had been trained in CPT/PE.

- Non-VA providers who underwent a training program for CPT/PE reported higher self-efficacy post-training, along with use of CPT/PE at 3 (58%) and 6 months (64%).

Among 25 articles addressing CPT and/or PE, the majority evaluated VHA national initiatives to implement these therapies (n=7) or persistent barriers and facilitators to their use in VHA settings (n=12), often 10 years or more after these initiatives were first launched. One article reported only pre-training survey results from mental health providers enrolled in the VHA national PE training program. VHA implementation of CPT and PE involved structured programs of in-person workshops (2-4 days) followed by 6-9 months of weekly consultation with experts. Consultants were nationally designated trainers that initially included individuals who had developed these therapies. For these consultation sessions, trainees were required to submit records of therapy sessions with patients, either session notes or audio-recordings. We classified the implementation strategies in these VHA initiatives as training/education, facilitation, and audit/feedback.

Additionally, 2 articles reported evaluations within VHA settings of different strategies to increase patient uptake and adherence—1 developed a new referral process in primary care for CPT/PE and another examined outcomes associated with preparatory psychoeducation groups for patients not ready to undergo CPT/PE. Finally, 3 articles evaluated CPT/PE in non-VA community settings: 1 examined outcomes of CPT/PE implementation, and 2 addressed barriers and facilitators among community providers. Similar to VHA program for implementing CPT/PE, the implementation program for community providers involved 2-day workshops (on CPT or PE) followed by 6 months of expert consultation that involved reviewing 3 audio-recorded patient sessions for each trainee.

Outcomes of VHA National Implementation for CPT and PE

Seven articles evaluated the VHA national training programs using surveys of mental health providers who were participating or who had completed training. Some articles also reported patient outcomes (obtained from the medical record or submitted during consultation) for those treated by these providers. Reported outcomes largely addressed Effectiveness, Adoption, Implementation, and Maintenance.

Four articles described effectiveness in terms of reduction in PTSD symptoms for patients who were treated by mental health providers either trained or undergoing training in CPT/PE. PTSD symptoms were assessed using the PTSD Checklist (PCL) before, during, and at the end of CPT/PE treatment. Average PCL scores decreased around 20 points from pre- to post-treatment. One article reported that the experience level of the therapist (trainee, completed training, and expert trainer) was associated with increased odds (adjusted odds ratio [aOR] 20.38 [1.03, 5.51]) of treatment response, defined as a decrease of at least 10 points and score less than 50 on PCL at the end of treatment.

Additionally, 2 articles reported reductions in depression symptoms for patients treated by trainees or providers who completed CPT/PE training. Depression was assessed using the Beck Depression Inventory-II (BDI-II); comparing pre- to post-treatment, average BDI-II scores decreased 8-11 points.

Four articles reported adoption outcomes, specifically improved provider attitudes and self-efficacy on surveys pre- and post-training. For example, among 656 providers who completed PE training, there was higher expectations for positive patient outcomes from PE, and lower expectations for negative patient outcomes, when comparing pre- and post-workshop, as well as post-workshop to post-consultation survey results. There was also greater average self-reported intent to use PE with patients for trainees after the consultation phase.

One article examined implementation via using survey data from providers trained in CPT, asking for reasons they had not started using CPT or could not use it with more patients; the top 2 reasons were "having no or little room in their schedule" and "workload is too heavy."

Finally, 2 articles reported outcomes pertaining to maintenance or sustainability. One examined the association of provider attitudes and self-efficacy pre- and post-training with self-reported use of PE at 6 months; pre-training expectations for positive and negative patient outcomes were associated with using PE for higher and lower numbers of patients, respectively. Changes in provider attitudes and self-efficacy during and after training were not associated with use of PE. One article reported on maintenance, using survey data from 566 providers who had completed PE training 6 and 18 months prior. Perceived effectiveness of PE on 6-month surveys predicted providers' self-reported use of PE at 18 months. Providers' positive perceptions at 6 months about their ability to generate referrals for PE was also predictive of using at 18 months.

VHA: New Referral Process and Preparatory Group Sessions

One article reported results from a new referral process for mental health treatment for PTSD. Stakeholder interviews were first conducted to identify a range of barriers and facilitators, then educational materials for PCPs and a referral system was developed. This involved 1 session of CBT delivered by PCMHI to referred patients. For reach, the primary care clinic using these strategies had 12% of its patients with PTSD (n=34) referred to psychotherapy, and 5% (n=13) attended at least 1 session of CPT/PE. A comparator clinic not using these new processes had 4% of its patients with PTSD referred to psychotherapy, and 1% who attended at least 1 session of CPT/PE. The authors intended to examine effectiveness (changes in PTSD symptoms and quality of life after referral), but data were available for only 9 patients who received CPT/PE.

Additionally, 1 article reported on reach and effectiveness of CPT/PE for patients who had first attended preparatory psychoeducation sessions, compared with patients who had not. Both groups of patients had decreased symptoms pre- to post-treatment, and there were no differences in completion rates. However, providers preferentially referred patients to preparatory sessions if "they had reservations" about CPT/PE; it was unclear how authors addressed bias due to selection, which may have masked the effects of preparatory groups (*ie*, only patients who were less likely to complete treatment were first referred to preparatory groups).

Barriers and Facilitators in VHA Settings

Fourteen articles addressed persistent barriers and facilitators in VHA settings, using mainly interviews with patients, mental health providers, and clinic and facility leadership. Reported results pertained to Intervention Characteristics, Outer Setting, Inner Setting, and Characteristics of Individuals; there were no results applicable to the Process domain.

Intervention Characteristics

Five articles provided results on several subdomains, including Intervention Source, Evidence Strength and Quality, Relative Advantage, Adaptability, and Complexity. Mental health providers thought CPT/PE to be generally effective but were concerned they may not work for all patients. CPT/PE were developed for civilians and may not adequately address comorbidities (both physical and mental health conditions) and complex trauma history commonly seen for Veterans in VHA care. Providers in clinics using less CPT/PE noted that these therapies "did not live up to expectations" and "described the clinical benefits as 'partial'." Providers noted as positives that CPT/PE were short-term and relevant but also thought other treatments can be effective. Additionally, providers noted the inflexibility of CPT/PE, the need to adapt the manualized content for certain patients, and lack of research guiding adaptations. Patients also found referral processes to be complex and burdensome. PCPs noted treatment of PTSD would also benefit from management of patients' physical health conditions.

Outer Setting

Seven articles described results pertaining to Patient Needs and Resources, Knowledge and Beliefs, and Other Attributes. Patients reported difficulty attending appointments due to competing personal commitments and medical care burden; some also had privacy concerns related to the stigma of mental health treatment. Shared decision-making, sharing stories of other patients who improved with CPT/PE, and discussing positive research on these therapies were reported to increase patient buy-in. However, some patients did not recall information about CPT/PE, or only had vague recollections, despite documented discussions. Providers were also concerned that patients used to receiving supportive therapy may not find short-term treatment credible. Some clinics offered preparatory psychoeducation groups to educate patients about CPT/PE and improve coping skills, and some screened patients to identify those receptive to CPT/PE. Providers noted the strong level of VHA support for CPT and PE (External Policies and Incentives), although these therapies were not perceived to fit well within broader community practices beyond VHA (General Practice Climate).

Inner Setting

Eleven articles addressed subdomains including Networks and Communication, Culture, Implementation Climate, Readiness for Implementation, Provider Decision-making, and Patient-Provider Relationships. For networks and communication, clinics using CPT/PE with more patients had weekly consultation groups for providers to discuss cases and other issues. Also, some patients reported frustrations with complexity and "red tape" in VHA processes for both mental and physical health conditions, leading to "overall rejection of the system."

Regarding culture, some mental health providers felt pressure to use CPT/PE, reporting that "the VA culture is like it's [CPT/PE] or nothing..." Provider perceptions of organization culture were not associated with provider use of or adherence to CPT/PE protocols. Some patients believed that VHA had a negative reputation, due to media reports or concerns from individuals in their social networks.

For implementation climate, providers in PTSD clinics using CPT/PE with more patients reported that their main mission was to deliver CPT/PE (Compatibility and Relative Priority); these sites also had databases that tracked patient referrals, attendance, and outcomes as metrics for feedback to staff and local leadership (Goals and Feedback). Another article reported that mental health and primary care leaders at 1 VHA facility perceived a need to increase the number of appropriate patient referrals for PTSD treatments.

Results on readiness for implementation included presence of local leaders who were experienced with CPT/PE and highly engaged in implementation of these therapies. PTSD clinics using CPT/PE with more patients also had dedicated resources, including protected time for staff to attend weekly consultation meetings and databases that tracked patient referrals and outcomes. Workload and scheduling challenges were often noted as barriers, but 1 study did not find these factors to be associated with providers' self-reported use of CPT/PE or adherence to therapy protocols. In another study, providers perceived ongoing VHA support for training, but other articles indicated that some clinics lacked trained staff and capacity to deliver CPT/PE. Mental health providers reported research results were helpful for treatment decisions, but they had variable confidence in research focusing on different types of PTSD (*eg,* PTSD with shame). PCPs were noted to need more information about availability of PTSD treatments, recognizing PTSD symptoms, and scripts to help with discussing PTSD treatments with hesitant patients. One article reported some patients disliked VHA facilities, which were maze-like, crowded, and perceived as unsafe.

With regard to provider decision-making, several articles highlighted consideration of patient factors in determining whether providers offered CPT/PE or other mental health treatments. In addition to patients' comorbidities, coping skill, and home situation, providers also considered patients' history of missed appointments. Providers sometimes made decisions without patient input but at other times, collaboratively with patients. Explaining treatment options and collaborative decision-making was noted as potentially helping with patient buy-in, although patients who were referred but did not initiate CPT/PE were also mostly satisfied with their involvement in decision-making. More providers preferred PE (vs CPT) for patients with low literacy, poor cognitive functioning, or traumatic brain injury; they preferred CPT for patients with strong guilt or shame.

Regarding patient-provider relationships, patients who were referred to CPT/PE but did not initiate treatment reported poor experiences with either providers making referrals or non-mental health clinicians. However, many of these patients also had positive experiences with mental health providers.

Characteristics of Individuals

Ten articles reported results pertaining to subdomains of Knowledge and Beliefs, Self-efficacy, and Other Personal Attributes. One article reported that providers were slowly growing in acceptance of patients improving with short-term therapy and being able to "move on." Mental health providers and leaders at sites using more CPT/PE reported commitment to these therapies;

they also believed that use of CPT/PE had benefits for the clinic, including better recruitment and morale among providers. Other studies reported that a variety of provider characteristics had small associations with both positive and negative perceptions of PE, and greater perceived effectiveness of CPT/PE was associated with higher use of CPT/PE. Several articles examined role of cognitive-behavioral orientation, finding that it was associated with perceived effectiveness of PE (but not with use of PE), and use of CPT. One article reported survey results of 247 mental health providers trained in CPT/PE, finding that 46% preferred PE and 13% preferred CPT; provider characteristics were not associated with preferences. One article noted that PCPs may value more CPT/PE if they were more familiar with the evidence supporting their effectiveness. One study also surveyed provider self-efficacy for PE, finding small associations between provider characteristics (*eg*, experience with PTSD treatments) and self-efficacy. Several other articles examined other characteristics of providers, including that graduate training in CBT was not associated with provider use of CPT/PE or provider perceptions of patient preferences for CPT/PE. Provider expressions of encouragement and reassuring manner were perceived by patients as helping them to move forward with CPT/PE, but some patients reported interruptions in treatment from providers leaving the facility (temporarily or permanently) due to a variety of reasons.

Implementation in Non-VA Settings, and Barriers and Facilitators

Only 3 articles addressed CPT/PE in non-VA settings. One reported outcomes of a training program for non-VA community mental health providers, which involved in-person workshops and external expert consultation, as VHA programs did. Adoption was assessed using surveys of 134 providers at 6 months post-workshop; trainees who were taking part in the consultation (rather than only completing workshops) had higher odds of self-reported use of CPT/PE (OR 11.37 [3.2, 40.3]).

Two articles addressed barriers and facilitators among community providers; 1 surveyed 463 mental health providers in Texas, who reported low overall barriers for using CPT/PE. For example, most (66%) perceived ability to be reimbursed for treating PTSD (Outer Setting—External Policies & Incentives), and most (64-70%) felt that treatments fit well within their existing practice (Inner Setting—Implementation Climate, Compatibility). However, few providers were trained in CPT/PE (<25%). The other article reported results from an online survey of 352 mental health providers in New England. Although 70% were comfortable treating Veterans, only 40% were familiar with CPT/PE and 34% had received training (Characteristics of Individuals—Knowledge and Beliefs, Other Attributes). Barriers to training included needing to take time from work and the cost of trainings (Inner Setting—Readiness for Implementation, Available Resources).

CBSST, DBT, MET, and Contingency Management (KQ 2)

Key Results

- Barriers for CBSST included
    - understaffed/overworked teams, additional administrative demands needed to deliver treatment, negative impact on provider productivity requirements
    - perceived burden of delivering treatment

- Facilitators for CBSST included
    - government/regulator rules, guidelines and resources that could be used to support implementation
    - leadership engagement
    - time for training support and monitoring and resources such as training materials and tools
    - networks/communication among providers to track progress
    - provider positive beliefs, openness to try new things, confidence delivering treatment
    - direct or indirect experience with positive outcomes attributed to CBSST
- MET knowledge and skills increased during VHA national training, with 53% of therapists using MET routinely after training.
- Over two-thirds of clinics integrated the standard course of contingency management (CM) in outpatient SUD treatment setting, with most operational over 40 months post-training.
- Leadership engagement and provision of resources facilitated implementation of DBT in VHA, but providers had difficulty completing online training during working hours.

One article addressed barriers and facilitators for CBSST in US community treatment teams; focus groups were conducted with a total of 87 participants from various stakeholder groups, including clients, providers, supervisors, agency administrators, public sector administrators, and CBSST developers/trainers.

Four other articles examined implementation outcomes in VHA settings following training for MET, CM, and DBT. Two of these focused on VHA national initiatives to implement MET and CM. The MET training program consisted of 3.5-day workshops followed by 6 months of consultation with training consultants, including review of audiotapes. We classified this implementation strategy as training/education, facilitation, and audit/feedback. The CM training program consisted of 4 trainings (each 1.5 days), followed by at least 2 conference calls during which implementation issues were further discussed. We classified the implementation strategies in this study as training/education and facilitation. One article reported outcomes following web-based DBT training at 10 VHA medical centers. Following training, providers met monthly with 1 of 2 DBT facilitators over 9 months to discuss engagement and facilitation techniques. We classified the implementation strategies as training/education and facilitation. The second article on DBT implementation was a VHA national program evaluation of a community of practice that had been created as a way to connect providers and share resources. We classified this implementation strategy as a learning collaborative.

Barriers and Facilitators for CBSST

One article evaluated barriers and facilitators for CBSST in community clinics, finding multiple factors across CFIR domains of Intervention Characteristics, Outer Setting, Inner Setting, and Characteristics of Individuals. For Intervention Characteristics, Adaptability and Complexity were raised, as provider's ability to apply the treatment flexibly "on the fly" during regular visits and having enough time during scheduled visits to go as "deep" as needed for the treatment.

Regarding the Outer Setting, External Policy and Incentives were facilitators for implementation of CBSST, including external rules, guidelines, funding resources, and data systems. Factors falling with Other Patient Attributes included relevance of CBSST concepts to clients, openness of clients to structured material (*eg*, workbooks, homework) and client motivation to do CBSST.

For Inner Setting, several factors pertained to Readiness for Implementation—Available Resources, including understaffed and overworked teams, additional administrative demands needed to deliver treatment, impact on provider productivity requirements, initial and ongoing training support, and monitoring of the implementation (*ie*, time allotted for training/supervision), and training resources such as materials and tools to support implementation. Leadership Engagement was also important, with results noting leadership buy-in of and support for treatment, prioritization of treatment by leadership and communication about importance of treatment from supervisors and leads. Implementation Climate—Compatibility was addressed by results indicating the extent to which CBSST complements and improves treatment process and structure and can be successfully implemented within the treatment program. Additionally, Networks and Communication was also described in terms of effectiveness of systems/processes to communicate client CBSST information among existing providers, making sure providers have tools to track/monitor client progress and seeing other providers succeed in delivering CBSST.

Finally, regarding Characteristics of Individuals, results on Knowledge and Beliefs about the Intervention included provider beliefs about whether CBSST improves client outcomes (*eg*, level of provider buy-in or enthusiasm for treatment), provider perception of usefulness and relevance of CBSST skills to other interventions, perceived burden of delivering CBSST, and direct or indirect experience with positive outcomes attributed to CBSST (*eg*, receiving positive feedback from clients about CBSST). Other factors included Self-efficacy (provider confidence in delivering CBSST) and Other Personal Attributes (provider openness to try new things).

Implementation of MET, CM, and DBT

Four articles evaluated various VHA implementation efforts for these EBPs, using survey data from trainees and those who completed training, and information about patients treated by providers and clinics implementing these EBPs. Adoption outcomes for 264 therapists were reported for a MET training program; 81% (n = 213) successfully completed all training requirements and MET-specific knowledge increased significantly from pre-training to post-workshop and post-consultation. Post-consultation, 53% of therapists indicated that they were using MET routinely.

Evaluation of CM national training program involved 94 VHA sites and 2060 patients over 55 months and addressed a variety of outcomes, including Effectiveness, Adoption, Implementation, and Maintenance. For Effectiveness, 91.9% of urine samples were negative for the targeted substance(s). For Adoption, 94 SUD treatment programs adopted CM over 4.5 years, and included sites in diverse settings. For Implementation, over two-thirds of clinics integrated the standard course of CM and the majority met specific indices of CM fidelity (*eg*, 96% of programs related prizes to abstinence and 81% asked about desired prizes). For Maintenance, the majority of CM programs were operational for over 40 months of the 55-month period since initial training.

One article evaluated online training and external facilitation of DBT skills for 44 providers at 10 VHA medical centers. Regarding Adoption, 54% (22 of 26 providers who responded to surveys 6 weeks post-training) reported having conducted DBT groups. For Implementation, many providers (73%) had difficulty completing online training during working hours. In terms of staff effort and cost, total personnel hours for the DBT skills training (facilitation experts, facilitators, and participants) were 1,298, and training costs included $17,894 for access to the web-based modules and copies of the Skills Training book

The fourth article evaluating the learning collaborative for DBT reported that "logistical, structural, and local policy changes facilitated implementation." For example, clinicians were given job flexibility and time to get DBT programs up and running. Sites created DBT programs that cut across clinics and modified VHA policy to allow clinicians to call patients outside of business hours.

DISCUSSION

Summary of Key Findings

To support the VA HSR&D Pain/Opioid CORE, we conducted a systematic review examining evidence on barriers and strategies to uptake of EBPs and outcomes of various implementation strategies. We identified 67 eligible articles, with most of these addressing CBT or CPT/PE. Additionally, the vast majority of studies were conducted in VHA, with the exception of those for MBSR and ACT, which occurred in non-VA US community settings or non-US countries, respectively. Key findings include:

- Evidence on CBT for chronic pain mostly addressed individual therapy (via telehealth or in person), while MBSR and ACT occurred in group settings.
- Barriers to CBT for chronic pain included cultural, communication, and logistical barriers; mismatch between patient knowledge and beliefs about pain and EBP principles; and patient attributes including high pain-related interference.
- Facilitators of CBT for chronic pain included positive patient-therapist dynamics; good match between patient knowledge and beliefs about pain and EBP principles; patient readiness for change; and telehealth availability.
- One article showed that CBT and MBSR for chronic pain were cost-effective for improving quality of life.
- Barriers to MBSR and ACT for chronic pain included mismatch between patient knowledge and beliefs about pain and EBP principles; the physical discomfort of being seated for sessions; and logistical conflicts.

- Facilitators of MBSR and ACT for chronic pain settings included positive group dynamics and good match between patient knowledge and beliefs about pain and EBP principles.

- Barriers of CBT for chronic mental health conditions included lack of resources and referring provider knowledge about CBT, and patient factors (*eg*, comorbidities, cultural and communication barriers, transportation barriers).

- Facilitators of CBT for chronic mental health conditions included scalability and convenience of CBT tools and resources, local champions and leadership support, strong networks and communication across clinics and teams.

- Barriers to CPT/PE in VHA settings included inflexibility of treatment protocols, complex referral processes, patient complexity and competing needs, and negative perceptions of VHA care.

- Facilitators of CPT/PE in VHA settings included strong support for training, perceived effectiveness for patients and benefits for clinics, and positive patient experiences and relationships with providers.

- In non-VA community settings, mental health providers generally had low concern for barriers, but few had been trained in CPT/PE.

- Barriers for CBSST included workload and staffing challenges; facilitators were supportive external policies and resources, leadership engagement, training support and materials, networks and communications among providers, and positive provider perceptions and experience.

- Facilitators for DBT included leadership engagement and training resources, but providers had difficulty completing online training during working hours.

- National or local VHA training initiatives for CBT, ACT, and CPT/PE involved training/education, facilitation, and audit/feedback.

- Large numbers of mental health providers have completed VHA national training programs for EBPs, leading to improved provider perceptions, self-efficacy, and provider skills for delivering EBPs, but persistent barriers limit reach and adoption.

- VHA implementation of CBT for chronic pain and chronic mental health conditions, ACT for depression, and CPT/PE reduced symptoms and improved quality of life for patients.

- Over two-thirds of VHA SUD treatment clinics (that participated in national VHA initiative) implemented standard CM, with most operational 40 months post-training.

- Non-VA providers who underwent a training program for CPT/PE reported higher self-efficacy post-training, and use of CPT/PE at 3 (58%) and 6 months (64%).

Results regarding barriers and facilitators to uptake of CBT, MBSR, and ACT for chronic pain mainly addressed patient-level factors. We classified these as pertaining to the CFIR domain of Outer Setting, including common subdomains Patient Needs and Resources and Patient Knowledge and Beliefs. A commonly perceived barrier to uptake of all 3 EBPs was mismatch between patients' pain beliefs and experiences and patients' perceptions of core EBP concepts, while a good match was a facilitator. Patient demographics did not consistently predict adherence to CBT, MBSR, or ACT; however, 1 study developing group CBT for a rural, low-literacy population with chronic pain found that lower educational attainment was associated with both declining to participate and not completing the intervention. Only 2 articles addressed barriers and facilitators at the provider or system level: 1 cost-effectiveness analysis of MBSR and CBT, and 1 analysis of GP interviews about chronic pain treatments including CBT.

Evidence on barriers and facilitators for EBPs for chronic mental health conditions addressed patient, provider, and system factors, and pertained to a variety of CFIR domains. Shared barriers across these EBPs included workload and scheduling challenges for providers, lack of educational resources and training for referring providers, transportation needs and competing responsibilities for patients, and variable patient buy-in to treatment rationale. Shared facilitators were leadership engagement, training and treatment delivery resources, communications and networks for continuing provider education, and positive patient-provider relationships.

VHA national training programs for a variety of EBPs increased provider self-efficacy and improved perceptions of EBP, particularly after completion of expert consultation, suggesting that there is additional benefit to audit and feedback. However, it is unclear to what degree these initiatives increased uptake by appropriate patients and overall adoption by providers. It is also unclear whether external facilitation has added benefits. National VHA training initiatives provided centralized facilitation resources, including salary support for clinicians; patient-facing EBP materials and tools; and coordination and organizational support for training and problem-solving. It is unclear to what degree these resources enhanced adoption in addition to training and audit/feedback. Only 1 small study examined external facilitation independently of training, finding no added benefit for facilitated participants in terms of specific CBT knowledge and skills at 3 months post-workshop.

In general, VHA training programs for a variety of EBPs led to sustained effects on provider use of EBPs but with persistent concerns about level of uptake by patients who would benefit from these treatments. Across EBPs, there was variable contribution of patient barriers to reach (*eg*, lack of acceptability for patients) and provider barriers to adoption (*eg*, workload and scheduling challenges) that resulted in lower numbers of patients receiving EBPs. In some cases, there were likely interactions between patient and provider factors, wherein lower patient acceptability may have contributed to provider concerns regarding appropriateness or prioritization of certain EBPs. In other cases, lower levels of uptake may primarily have been due to lack of capacity for treatment delivery (*eg*, competing work demands for providers).

These results indicate that VHA national initiatives for EBPs have largely not focused on patient barriers and facilitators for uptake or addressed potential heterogeneity in treatment response due to patient factors. A notable exception may be the interactive decision aid for PTSD (developed by the VA National Center for PTSD) that provides tailored treatment information and recommendations according to patient preferences and values. Additionally, there may be important tradeoffs to consider for options that address transportation barriers and competing responsibilities during the workday. For example, EBPs may be delivered via telephone or videoconferencing, to address transportation and time barriers, but this may negatively impact development of therapeutic alliance due to lack of in-person contact. Moreover, our results show that different patients may have strong and opposing preferences for formats (*eg*, telephone vs in-person sessions) or communication styles (*eg*, group facilitators maintaining structured control vs letting participants tell their own stories at length), which may be difficult for mental health clinics and providers to accommodate. It also remains unclear how options in EBP format or tailoring may improve treatment uptake and response.

Finally, our results showed variation in the formats and duration of certain EBPs. These differences likely reflect consideration of resources (space and provider capacity) and patient needs (extending sessions to account for patient progress). Such variability present substantial challenges in distinguishing the "core" of essential treatment characteristics from the "adaptable periphery" of elements that may be modified without threatening efficacy. Additionally, some implementation strategies aimed at increasing patient readiness for EBPs (*eg*, patient preparatory groups) may constitute distinctive treatments that warrant high-quality studies examining efficacy along with implementation outcomes. However, our results also suggest that efforts to clearly define EBP content and duration may lead to greater provider barriers to adoption of EBPs, due to higher perceived inflexibility and lack of adaptability.

Implications for VA Policy

VHA has made substantial investments in providing high-quality EBPs and remains committed to improving access to mental health services for Veterans. Our results indicate that VHA national training programs for EBPs have greatly increased the number of mental health providers who are prepared to deliver EBPs. However, our results on persistent barriers to uptake suggest that VHA national initiatives for EBPs should focus on additional avenues to further increase the reach of these therapies. First, there may be value in coordinated efforts to address patient-level barriers to uptake. While VHA has developed patient-facing EBP educational materials, these may not adequately address patient concerns. To be successful, informational materials may need to be tailored to address specific concerns and optimized for dissemination to particular groups. Thus, development and dissemination of improved patient-facing resources may help increase patient awareness and buy-in.

Additionally, national VHA programs may consider guidance or support for delivery formats or options beyond in-person meetings during the workday. During the COVID-19 pandemic, there were rapid shifts to EBPs delivered via telehealth; ongoing evaluations of these experiences may help deepen our understanding of the impacts and trade-offs between different delivery formats, thereby helping to inform best practices that can be disseminated across VHA facilities.

It may also be important for VHA initiatives to provide additional support and information for facilities regarding how to organize and integrate mental health services. For example, how should local leadership evaluate their capacity for delivering various EBPs and potentially balance competing demands and priorities between EBPs? There may also be opportunities for integrating mental health services that will improve efficiency and enhance uptake, including with primary care or other specialty care services. Efforts to simplify referral pathways and remove lines separating treatments for mental and physical health may simultaneously reduce barriers for referring providers and address patient reticence. Given the potential diversity in local resources, needs, and priorities, national VHA initiatives may consider providing guidance on performing local needs assessments and matching strategies or resources to those results.

Therefore, we suggest the following:

- Develop and disseminate tailored patient-facing resources to increase awareness and buy-in
- Evaluate outcomes for alternative EBP delivery formats and modalities (*eg*, telehealth vs in person, individual vs group therapy, brief vs longer treatment duration), and when appropriate, support increased options for session format and scheduling flexibility
- Evaluate and support strategies for streamlining EBP referral processes
- Provide guidance on local needs assessment for implementation readiness and matching of strategies and resources

Research Gaps/Future Research

There was very limited evidence on provider- and system-level barriers and facilitators for EBPs for chronic pain. Because we anticipated this potential gap, we undertook a broader review that examined evidence for EBPs for chronic mental health conditions. However, there are likely some factors that are unique to EBPs for chronic pain, including provider views about effectiveness or acceptability of EBPs, availability of resources, and interactions with other VHA initiatives (*eg*, regarding opioid safety). These factors may contribute to provider referral patterns that are distinct from EBPs for chronic mental health conditions. Additionally, most analyses of patient-level barriers and facilitators for EBPs for chronic pain, particularly for ACT and CBT, were conducted within effectiveness RCTs rather than in non-research clinical contexts. As barriers and facilitators to adherence likely vary meaningfully between clinical trials and clinical practice, we recommend future evaluations of barriers and facilitators to EBPs for chronic pain within clinical practice settings.

Results related to EBPs for chronic pain suggest there may be substantial heterogeneity in relationships of patient-level factors to treatment uptake, but we lack evidence on how EBPs may be tailored to improve uptake and outcomes. Heterogeneity in relationships of patient-level factors to treatment effects is also evident within EBPs for chronic pain, and is becoming a methodological focus of future pain treatment research as well as behavioral health research in general. More systematic assessment of heterogeneity of treatment effects as well as of treatment uptake may identify specific patient-level targets suitable for future implementation or hybrid effectiveness-implementation work. More research is also needed to identify and clarify cultural and social factors that may mitigate both effectiveness and patient adherence, in order to inform culturally and socially relevant adaptations of EBPs for chronic pain where needed. While quantitative analyses using electronic medical record data on patient "race" and "ethnicity" did not identify barriers to adherence, these indicators are poor proxies for patient cultural and social experience. Similarly, while quantitative analyses including either "sex" or "gender" did not identify barriers to adherence, it was unclear what was actually assessed. No studies explored roles of culture, race, sex, gender, or social factors in patients' perspectives or experiences of EBPs for chronic pain.

The vast majority of results on implementation efforts for EBPs were from VHA national training programs. These included education/training, audit/feedback, and external facilitation. While some results indicated that audit/feedback may be important for improving provider perceptions and skills, there was a lack of evidence evaluating the impact of external feedback. This may be especially crucial to understand for healthcare systems that have less resources than VHA and thereby, lack capacity for external facilitation on the same scale as VHA initiatives. Additionally, evaluations of VHA national training programs generally did not address reach, *ie*, the proportion and representativeness of patients who initiated or completed EBPs. Although reach may be challenging to measure, even for large integrated systems such as VHA, it is nevertheless critical to assess how many (and which) patients benefit from treatments. The ultimate metric for evaluating success of any implementation strategy must be whether it increased the reach of effective treatments, leading to better outcomes for more individuals. Particularly for chronic pain treatments, evaluation of reach across a variety of clinical settings should occur in conjunction with further research into provider- and system-level factors that contribute to differences in referral rates and treatment engagement.

Few studies utilized comprehensive, theoretical frameworks for assessing barriers/facilitators, examining process of change in implementation trials, and reporting outcomes. Future implementation work should be guided by theoretical domains linking barriers to strategies, evaluating processes of change, and comprehensively understanding outcomes in key domains. The new CFIR subdomains that arose from this work, including Patient Knowledge and Beliefs, Other Patient Attributes, Group Dynamics, and Patient-therapist Dynamics, may be helpful in future efforts to examine patient-level barriers to engagement with EBPs.

No studies analyzed barriers, facilitators, or implementation strategies for group CBT for chronic pain, individual ACT for chronic pain, or individual MBSR for chronic pain. While MBSR was developed in a group format for chronic pain as well as for other mental health conditions, both CBT and ACT are provided regularly in both group and individual formats. Future research should analyze both efficacy and implementation for group CBT formats and individual ACT formats as treatments for chronic pain.

Finally, future research is needed to evaluate asynchronous digital and brief formats as possible avenues to increase reach of EBPs by addressing patient-level barriers (*eg*, transportation, time, and geographical distance). Ongoing work shows promise in establishing the efficacy and effectiveness of asynchronous digital formats for delivering EBP. Although these digital interventions may eliminate some barriers, it is currently unclear if they can achieve the same benefits in symptom reduction and quality of life as traditional synchronous EBPs. Furthermore, examination of implementation outcomes will also be needed to identify potentially unique barriers for these interventions. Similarly, brief formats for EBPs are another promising strategy for enhancing reach and reducing patient and provider barriers. In the case of CBT-I, initial work has demonstrated effectiveness of a brief format, while ongoing studies are exploring the effects on reach, adoption, implementation, and maintenance.

Therefore, we recommend the following for future research:

- Examine provider- and system-level barriers and facilitators for CBT, MBSR, and ACT for chronic pain using comprehensive frameworks and in clinical practice settings.

- Evaluate patient-level factors contributing to heterogeneity of treatment effects and treatment uptake for EBPs for chronic pain and identify targets for future effectiveness and implementation work.

- Evaluate patient-level sociocultural and demographic factors including sex, gender, race, and ethnicity accurately and with clear analytic purpose, recognizing the importance of clear definitions consistent with data analyzed and the roles of demographic indicators as limited proxies for sociocultural experience.

- Evaluate the added value of external facilitation when used with education/training and audit/feedback.

- Describe reach for EBPs associated with implementation strategies, such as VHA national training programs for EBPs.

- Use implementation frameworks to guide future evaluations of barriers and facilitators, processes of change, and outcomes in key domains.

- Evaluate efficacy and implementation outcomes for group CBT formats and individual ACT formats as treatments for chronic pain.

- Evaluate efficacy and implementation outcomes for asynchronous digital and brief formats for various EBPs.

Limitations

We aimed to be inclusive in examining evidence on barriers, facilitators, and implementation outcomes for a broad range of EBPs for chronic mental health conditions. But given our focus on those results that would be most applicable to VHA settings and the implementation of EBPs for chronic pain, we included EBPs that were recommended for eligible conditions and were available in VHA. Thus, we did not include EBPs that may be recommended for particular conditions but were not accessible in VHA. We also sought to focus on provider- and system-level barriers and facilitators for implementation of EBPs for chronic mental health conditions, due to the greater applicability of such results for implementation of EBPs for chronic pain. However, results often involved interrelationships between patient, provider, and system factors. Additionally, some patient factors appeared consistent across the types of EBPs, such as transportation barriers and competing work and family responsibilities. Therefore, we elected to include results on patient-level barriers and facilitators for EBPs for chronic mental health conditions. We limited eligibility to studies conducted in the US or in a small set of non-US countries with comparable economic, cultural, and public health contexts (Canada, UK, Ireland, and Australia). Although evidence from excluded countries would likely have been less applicable, it is possible that it may have provided some relevant information.

Conclusions

Studies of barriers and facilitators to EBPs for chronic pain focused largely on patient-level findings, with little provider- or system-level information. VHA training programs for a variety of EBPs for chronic pain and mental health conditions led to sustained effects on provider use of EBPs but with persistent concerns about level of uptake by patients who would benefit from these treatments, and maintenance of effects for providers who deliver these treatments. Shared barriers across EBPs included workload and scheduling challenges for providers; lack of educational resources and training for referring providers; transportation needs and competing responsibilities for patients; and variable patient buy-in to EBP rationale. Shared facilitators were leadership engagement; training and treatment delivery resources; communications and networks for continuing provider education; and positive patient-provider relationships. Future work is needed to explore heterogeneity of treatment effects within EBPs for chronic pain, as well as provider- and system-level barriers and facilitators for EBPs for chronic pain. Additionally, VHA national initiatives for EBPs have largely not focused on patient factors affecting uptake and heterogeneity in treatment. It may be useful to develop and disseminate patient educational materials to increase awareness and acceptability of EBPs. It will also be important to evaluate outcomes for alternative EBP delivery formats and modalities. At a provider- and system-level, VHA facilities may benefit from strategies to streamline EBP referral processes, and guidance for conducting local needs assessment on implementation readiness and matching of strategies and resources.

ABBREVIATIONS TABLE

ACT	Acceptance and commitment therapy
AHRQ	Agency for Healthcare Research and Quality
aOR	Adjusted odds ratio
BDI	Beck Depression Inventory
BPI	Brief pain inventory
CASP	Critical Appraisal Skills Programme
CBT	Cognitive behavioral therapy
t-CBT	Telephone cognitive behavioral therapy
CBT-CP	Cognitive behavioral therapy for chronic pain
CBT-I	Cognitive behavioral therapy for insomnia
CBSST	Cognitive behavioral social skills training
CDC	Centers for Disease Control and Prevention
CFIR	Consolidated Framework for Implementation Research
CESD	Center of Epidemiological Studies Depression Scale
CI	Confidence interval
CM	Contingency management
CORE	VA Pain/Opioid Consortium of Research
CPT	Cognitive processing therapy
DBT	Dialectical behavior therapy
DoD	Department of Defense
EBP	Evidence based psychotherapy
EPC	Evidence-based Practice Center
ERIC	Expert Recommendation for Implementation Change
ESP	Evidence Synthesis Program
GP	General practitioner
HSR&D	VA Health Services Research and Development
IAPT	Improving Access to Psychological Therapies
KQ	Key Question
MET	Motivational enhancement therapy
MSBR	Mindfulness-based stress reduction
NHS	UK National Health Service
NR	Not reported
OCD	Obsessive-compulsive disorder
OR	Odds ratio
PE	Prolonged exposure therapy
PCL	PTSD Checklist
PCMHI	Primary Care Mental Health Integration
PCP	Primary care provider
PSOCQ	Pain Stages of Change Questionnaire
PTSD	Posttraumatic stress disorder
QALY	Quality-adjusted life years

QOL	Quality of life
RCT	Randomized controlled trial
RE-AIM	Reach, effectiveness, adoption, implementation, maintenance
RMDS	Roland-Morris Disability Scale
SD	Standard deviation
SUD	Substance use disorder
TEP	Technical Expert Panel
UC	Usual care
UK	United Kingdom
US	United States
VHA	Veterans Health Administration
WHYMPI-INT	West Haven–Yale Multidimensional Pain Inventory

INTRODUCTION

Chronic pain conditions comprise 3 of the top 5 causes of disability in the United States (US) and contribute to other disabling conditions, such as opioid use disorder (ranked 8th).[1] In 2011-2012, chronic pain was estimated to affect at least 100 million US adults and to cost more than $600 billion in treatment and lost productivity.[2,3] Research suggests that chronic pain prevalence has continued to increase, with concomitant higher levels of psychological distress.[4] The persistence or recurrence of pain profoundly impacts physical, mental, and social functioning. Individuals with chronic pain have higher prevalence of mental health conditions, including posttraumatic stress disorder (PTSD), depression, and insomnia; they are also at greater risk for other chronic health conditions.[5-8] Veterans have a higher prevalence of chronic pain conditions compared to civilians,[8-11] resulting in significant healthcare costs for the Veterans Health Administration (VHA).[12-14]

People with chronic pain often receive medical treatments, such as opioids and surgery, that have limited benefit in many circumstances and carry higher risk for adverse events.[2,15,16] The VA/Department of Defense (DoD) clinical practice guidelines and the Centers for Disease Control and Prevention (CDC) guidelines recommend nondrug, noninvasive therapies with demonstrated functional benefits as first- and second-line treatments for chronic pain.[16-19] First-line options for pain management include evidence-based psychotherapies (EBPs), exercise and physical therapy, and non-opioid medications. EBPs that have demonstrated efficacy for improving chronic pain outcomes include cognitive behavioral therapy (CBT), acceptance and commitment therapy (ACT), and mindfulness-based stress reduction (MBSR).[20,21] Because research suggests that no single therapy is effective for the majority of patients with chronic pain and pain treatment responses are heterogeneous, experts recommend personalized multimodal care—using multiple treatment approaches in a stepped or integrated fashion.[22]

VA is committed to improving nonpharmacological treatment and reducing opioid-related harms for Veterans with chronic pain.[16,17,19] VHA has engaged in national dissemination and implementation of EBPs, including CBT for chronic pain,[23,24] but critical gaps remain. EBPs are underutilized in VHA clinical settings and are not widely integrated into chronic pain care.[25,26] To help identify areas of research critical for improving uptake of these therapies, the VA Health Services Research & Development (HSR&D) Pain/Opioid Consortium of Research (CORE) requested an evidence review on barriers, facilitators, and implementation strategies for EBPs in chronic pain. We included CBT, ACT, and MBSR since these EBPs have demonstrated efficacy for improving chronic pain outcomes, are included in treatment guidelines for chronic pain, and are being delivered in VHA settings; therefore, implementation research is a logical next step. Additionally, because some findings from implementation of EBPs to treat chronic mental health conditions may be applicable to implementation of EBPs for chronic pain, the Pain/Opioid CORE asked the VA Evidence Synthesis Program (ESP) to identify and summarize studies examining barriers, facilitators, and implementation strategies for these other EBPs. This may be especially true for studies conducted within VHA, where provider- and system-level barriers and facilitators or implementation strategies for other EBPs may more readily generalize to EBPs for chronic pain. Similar to the selection process of EBPs for chronic pain, we included EBPs that have a strong evidence base and are included in treatment guidelines for mental health conditions. Selected EBPs are being delivered at VHA facilities to treat common conditions, including insomnia, depression, and PTSD.

In this systematic review, we sought evidence relevant to implementation of EBPs for chronic pain and chronic mental health conditions, focusing on 1) barriers and facilitators at the patient, provider, and system levels; and 2) results of various implementation strategies aimed at promoting uptake of and engagement with EBPs. We present qualitative summaries of results for barriers and facilitators, focusing first on CBT, ACT, and MBSR for chronic pain and then discussing CBT for other conditions, including insomnia and substance use disorders. Next, we summarize outcomes from use of implementation strategies for increasing uptake of these EBPs, for chronic pain and other conditions. Finally, we summarize results regarding barriers, facilitators, and effects of implementation strategies for additional EBPs for chronic mental health conditions, including trauma-focused psychotherapies for PTSD.

METHODS

The protocol was registered in PROSPERO: CRD42021252038.

TOPIC DEVELOPMENT

Collaboratively with representatives from the VA Pain/Opioid CORE and an advisory panel of experts, we defined the scope, formulated key questions (KQ), and determined the eligibility criteria. Because the goal of this evidence synthesis is to support implementation of EBPs for chronic pain, we first focused on those psychotherapies with the strongest evidence base for efficacy in chronic pain treatment, CBT, ACT, and MBSR.[20,21] Additionally, we also considered implementation evidence for those EBPs recommended by clinical guidelines for various mental health conditions (*eg*, depression, PTSD[27,28]) and readily available within VHA. For implementation of EBPs for non-pain conditions, we focused on provider- and system-level barriers and facilitators because these would likely be more applicable to improving implementation of psychotherapies for pain. We considered patient factors in a non-pain context more likely to be distinct from and less applicable to implementation of chronic pain treatments. Additionally, in order to identify evidence with greater applicability for Veterans enrolled in VHA, we sought studies that examined barriers and facilitators, or evaluated implementation strategies, in large integrated health care delivery systems. We expanded the setting beyond the US to include Canada, the UK, Ireland, and Australia for 2 reasons—1) existence of integrated health systems with qualities similar to VHA; and 2) comparable economic, cultural, and public health contexts, including predominant use of English.

KEY QUESTIONS

KQ1: For cognitive behavioral therapy, acceptance and commitment therapy, and mindfulness-based therapy used to treat adults with **chronic pain**:

- a) What are the patient-, provider-, and system-level barriers and facilitators for treatment uptake?
- b) What is the effect of implementation strategies to increase uptake of these treatments?

KQ2: For evidence-based psychotherapies and mindfulness-based interventions used in integrated delivery systems to treat adults with **chronic mental health conditions**:

- a) What are the provider- and system-level barriers and facilitators to treatment uptake?
- b) What is the effect of implementation strategies to increase uptake of these treatments?

SEARCH STRATEGY

We searched the following databases from inception through March 2021: MEDLINE, Embase, PsycINFO, and CINAHL. Search terms included MeSH and free text for: EBP names (*eg*, CBT, ACT, and MBSR), chronic pain, integrated delivery systems and Veterans (Appendix A). We also sought relevant systematic reviews from the Agency for Healthcare Research and Quality (AHRQ) Evidence-based Practice Center (EPC) reports and VA ESP reports; we hand-searched relevant reviews for potentially eligible studies. Our expert advisory panel also provided referrals.

SCREENING AND SELECTION OF ELIGIBLE STUDIES

Duplicate results were removed and abstracts were screened using DistillerSR (Evidence Partners, Ottawa, Canada). Prespecified eligibility criteria (Appendix B) included: outpatient treatment of adults with chronic pain or chronic mental health condition; EBPs used for chronic pain or chronic mental health conditions (*eg*, CBT, ACT, MBSR, Prolonged Exposure Therapy [PE], and Cognitive Processing Therapy [CPT]); examination of barriers and facilitators, and/or evaluation of implementation strategies; and conducted in the US, United Kingdom (UK), Ireland, Canada, or Australia. Exclusion of abstracts required agreement of 2 reviewers. Included abstracts underwent full-text review by 2 individuals, with eligibility decisions requiring consensus of both reviewers.

DATA ABSTRACTION AND QUALITY ASSESSMENT

All eligible articles underwent independent data abstraction by 2 individuals for: participant characteristics and setting (including country and whether study was conducted in VHA); EBP being evaluated; data sources and analytic methods (*eg*, semi-structured interviews and framework analysis, or surveys and multivariate logistic regression); and outcomes. We extracted demographic data in categories consistent with terminology used by authors, including gender and sex. For articles evaluating barriers and facilitators, we classified outcomes by domains within the Consolidated Framework for Implementation Research (CFIR).[29,30] CFIR consists of 5 major domains: I) Intervention characteristics; II) Outer setting; III) Inner setting; IV) Characteristics of the individuals involved; and V) Process of implementation. Each major domain has additional subdomains (see Table 1). CFIR has been recommended as a unifying structure for examining major constructs that influence implementation of evidence-based mental health treatments.[30] For those that addressed effects of implementation strategies (*eg*, training and education), we categorized outcomes by RE-AIM: Reach (*eg*, uptake by target populations); Effectiveness (*eg*, patient outcomes, cost-effectiveness); Adoption (*eg*, uptake by providers), Implementation (*eg*, consistency and fidelity of intervention delivery), and Maintenance (*eg,* sustainability of effects).[31,32] We also classified implementation strategies according to the expert recommendations for implementing change (ERIC) project.[33,34]

All quantitative results were abstracted by 1 reviewer and over-read by a second reviewer. Qualitative results were independently coded by at least 2 reviewers, with final codes reached by consensus. A priori codes were generated from either CFIR (for barriers and facilitators) (Table 1 and Appendix C) or RE-AIM (for evaluation of implementation strategies) (Table 2). We allowed for emergence of new codes, if results did not fit well within existing frameworks. We used a best-fit framework synthesis approach to categorize results and adapt the frameworks as needed; we developed new CFIR subdomains within Outer Setting to facilitate interpretation of data on barriers and facilitators. For evaluations of implementation strategies, we categorized provider attitudes and self-efficacy within Adoption, as the most appropriate domain. These provider factors were assessed to improve understanding about why some providers will (or will not) use certain EBPs.

Two reviewers independently assessed quality using criteria adapted from either the Newcastle-Ottawa Scale[35] (for quantitative studies) and the Critical Skills Appraisal Programme (CASP) Checklist for qualitative studies.[36] We also rated overall quality as high, moderate, or low. Consensus on quality ratings was reached through discussion. For studies that used mixed-methods (*ie*, quantitative and qualitative methods), we used both sets of criteria to separately rate the applicable results. Quality assessment criteria can be found in Appendix D.

DATA SYNTHESIS

Given heterogeneity in populations, different types of EBPs, and variable study designs among eligible articles, we did not conduct quantitative meta-analyses. We undertook a qualitative synthesis, focusing first on results for CBT, ACT, and MBSR for chronic pain. We then summarized results related to use of CBT, ACT, and MBSR to treat other conditions. Finally, we described results regarding other EBPs, including trauma-focused therapies for PTSD (PE and/or CPT), cognitive behavioral social skills therapy (CBSST), MET, contingency management, and Dialectical Behavioral Therapy (DBT).

For all eligible articles (whether using quantitative and/or qualitative methods), we first created tables with detailed results (classified or coded as described above). We then reviewed these results within categories, and across articles addressing the same EBP, to derive themes related to barriers and facilitators for implementation and implementation outcomes. We used CFIR for the synthesis of barriers and facilitators to implementation, and the RE-AIM framework for synthesis of implementation outcomes (with grouping of studies by ERIC strategies).

RATING THE BODY OF EVIDENCE

A formal certainty of evidence rating was not conducted as part of this review.

PEER REVIEW

A draft version of this report was reviewed by content experts and VA operational partners. Their comments and our responses are presented in Appendix E and the report has been modified as needed.

Table 1. Adaptation of the Consolidated Framework for Implementation Research (CFIR): Domains and Subdomains[a]

I. Intervention characteristics
- A. Intervention source
- B. Evidence strength & quality
- C. Relative advantage
- D. Adaptability
- E. Trialability
- F. Complexity
- G. Design quality & packaging
- H. Cost
- *I. Group dynamics*
- *J. Patient-therapist dynamics*

II. Outer setting
- A. Patient needs & resources
- B. Cosmopolitanism
- C. Peer pressure
- D. External policies & incentives
- *E. Patient knowledge & beliefs*
- *F. Other patient attributes*
- *G. General practice climate & patterns*

III. Inner setting
- A. Structural characteristics
- B. Networks & communications
- C. Culture
- D. Implementation climate
  - 1. Tension for change
  - 2. Compatibility
  - 3. Relative priority
  - 4. Organizational incentives & rewards
  - 5. Goals and feedback
  - 6. Learning climate
- E. Readiness for implementation
  - 1. Leadership engagement
  - 2. Available resources
  - 3. Access to knowledge and information
- *F. Provider decision-making*
- *G. Patient-provider relationships (outside of psychotherapy)*

IV. Characteristics of individuals
- A. Knowledge & beliefs about the intervention
- B. Self-efficacy
- C. Individual stage of change
- D. Individual identification with organization
- E. Other personal attributes

V. Process
- A. Planning
- B. Engaging
  - 1. Opinion leaders
  - 2. Formally appointed internal implementation leaders
  - 3. Champions
  - 4. External change agents
- C. Executing
- D. Reflecting & evaluating

[a] Adapted from Damschroder et al., 2009[29] and Damschroder and Hagedorn, 2011;[30] new subdomains noted in italics; see Appendix C for detailed definitions

Table 2. RE-AIM Framework Domains and Definitions[a]

Reach	The absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative, intervention, or program, and reasons why or why not. *How do I reach the targeted population with the intervention?*
Effectiveness	The impact of an intervention on important individual outcomes, including potential negative effects, and broader impact including quality of life and economic outcomes; and variability across subgroups (generalizability or heterogeneity of effects). *How do I know my intervention is effective?*
Adoption	(Setting levels) The absolute number, proportion, and representativeness of settings and intervention agents (people who deliver the program) who are willing to initiate a program, and why. *How do I develop organizational support to deliver my intervention?*
Implementation	At the setting level, implementation refers to the intervention agents' fidelity to the various elements of an intervention's key functions or components, including consistency of delivery as intended and the time and cost of the intervention. Importantly, it also includes adaptations made to interventions and implementation strategies. *How do I ensure the intervention is delivered properly?*
Maintenance	At the setting level, the extent to which a program or policy becomes institutionalized or part of the routine organizational practices and policies. At the individual level, maintenance has been defined as the long-term effects of a program on outcomes after a program is completed. *How do I incorporate the intervention so that it is delivered over the long term?*

[a] Definitions from www.re-aim.org and Glasgow et al, 2019[32], slightly edited for length.

RESULTS

OVERVIEW OF ELIGIBLE ARTICLES

We screened 7295 unique citations from database searches, and reviewed the full text for 506 articles, including 7 that were identified by hand searches of relevant systematic reviews (Figure 1). We identified 67 eligible articles—20 that addressed KQ 1, 46 for KQ 2, and 1 applicable to both KQ 1 and 2. We provide a summary of characteristics for all eligible articles in Table 3. Most articles were conducted in the US (n=59), and the vast majority of these were in VHA settings (n=47). Most articles were of high or moderate quality (n=53). Detailed quality ratings for all articles are provided in Appendix F.

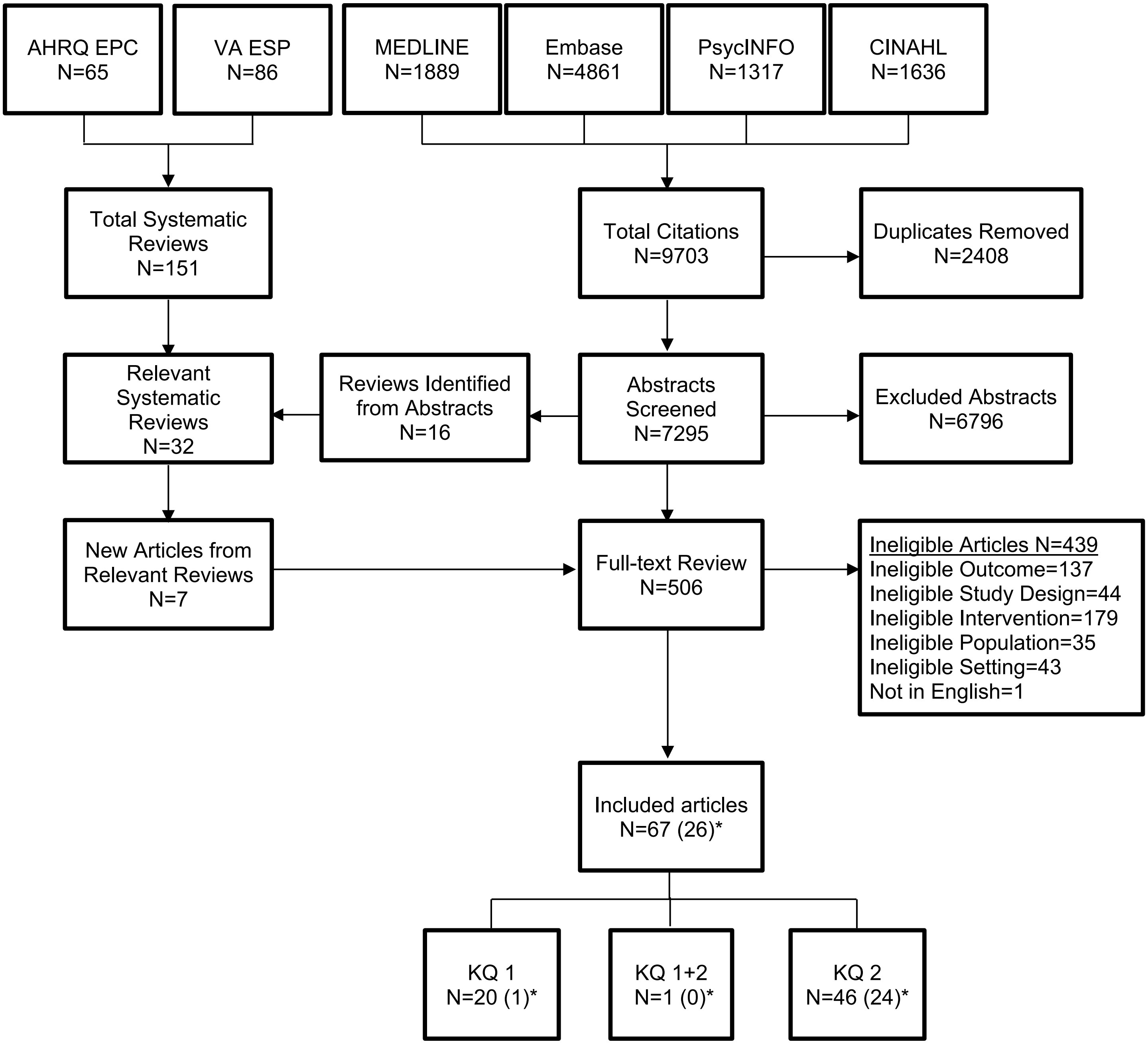
Nearly all articles addressing KQ 1 examined only barriers and facilitators (n=20).[24,37-55] Only 1 article evaluated outcomes of implementation strategies; this evaluated the VHA national training program for CBT-CP.[24] Most KQ 1 articles addressed CBT (n=14),[37,39-41,45,46,48-53,55] while fewer addressed MBSR (n=5)[38,43,44,55,56] and ACT (n=4).[42,46,47,54] Half of these articles used qualitative methods (n=10), and the remaining used only quantitative techniques (most often questionnaires of RCT participants or analyses of electronic medical record data).

Among articles addressing KQ 2, about half examined only barriers and facilitators (n=22),[56-72] with the remaining half evaluating implementation strategies (n=25).[73-96] A third of articles examined CBT for a variety of conditions (n=15),[57,59,64,81,83,85,86,88-90,92-94,97,98] while half addressed trauma-focused therapies for PTSD (PE and CPT, n=25). Remaining articles examined MBSR,[56] ACT,[84] CBSST,[99] DBT,[95,96] MET,[79] and contingency management.[100] A third of articles used qualitative methods (n=16), with the remaining articles reporting only quantitative results.

Below, we first describe detailed results for barriers and facilitators for CBT, MBSR, and ACT for chronic pain. We then provide findings for barriers and facilitators for CBT used to treat other conditions (depression, insomnia, substance use disorder [SUD], and obsessive-compulsive disorder [OCD]). Table 4 provides summaries of barriers and facilitators for CBT, MBSR, and ACT for chronic pain and mental health conditions.

Next, we describe outcomes of implementation strategies for CBT for a variety of conditions, including chronic pain, and ACT for depression; these results are summarized in Table 5. Then, we provide results on barriers, facilitators, and effects of implementation strategies for trauma-focused psychotherapies for PTSD—CPT and PE (Table 6 and Table 7). Finally, we summarize results for barriers and facilitators and implementation strategies for other EBPs, including CBSST, DBT, MET, and contingency management.

Figure 1. Search and Selection of Eligible Articles



*Articles that evaluated outcomes of implementation strategies are shown in ()

Table 3. Summary of Characteristics for Included Articles

	# Total	# High/ Mod. Quality	Country:			Barriers & Facilitators:		Implementation Strategies:	
			# US (VHA)	# UK	# Others[a]	# Quantitative	# Qualitative	# Quantitative	# Qualitative
KQ1: Chronic Pain									
Cognitive Behavioral Therapy (CBT)	14	14	11 (7)	2	1	9	4	1	—
Mindfulness-based Stress Reduction (MBSR)	5	3	5 (1)	—	—	2	4	—	—
Acceptance & Commitment Therapy (ACT)	4	4	1 (1)	2	1	2	3	—	—
KQ2: Chronic Mental Health Conditions									
Cognitive Behavioral Therapy (CBT)	15	12	13 (9)	1	1	1	4	9	2
Mindfulness-based Stress Reduction (MBSR)	1	1	1 (1)	—	—	—	1	—	—
Acceptance & Commitment Therapy (ACT)	1	1	1 (1)	—	—	1	—	1	—
Trauma-focused Psychotherapies (PE & CPT)	25	18	25 (22)	—	—	9	7	10	1
Other Psychotherapies[b]	5	3	5 (5)	—	—	—	1	3	1

CPT=Cognitive Processing Therapy; PE=Prolonged Exposure Therapy; US=United States; UK=United Kingdom; VHA=Veterans Health Administration

[a] Includes Australia and Ireland

[b] Includes Cognitive Behavioral Social Skills Training, Motivational Enhancement Therapy, Contingency Management, and Dialectical Behavior Therapy

CBT, MBSR, AND ACT FOR CHRONIC PAIN: BARRIERS AND FACILITATORS (KQ 1A)

Key Results

- All articles assessing CBT for chronic pain involved individual therapy (via telehealth and in person), except 1 cost-effectiveness analysis; all articles assessing MBSR or ACT for chronic pain involved in-person group therapy.
- Barriers to CBT for chronic pain included cultural and communication barriers, mismatch between patient knowledge and beliefs about pain and EBP principles, logistical conflicts for patients, and patient attributes including high pain-related interference.
- Facilitators of CBT for chronic pain included positive patient-therapist dynamics, good match between patient knowledge and beliefs about pain and EBP principles, patient readiness for change, and telehealth availability.
- One article showed that CBT and MBSR for chronic pain were cost-effective for improving quality of life.
- Barriers to MBSR and ACT for chronic pain included mismatch between patient knowledge and beliefs about pain and EBP principles, physical discomfort of being seated for sessions, and logistical conflicts for patients.
- Facilitators of MBSR and ACT for chronic pain settings included positive group dynamics and good match between patient knowledge and beliefs about pain and EBP principles.

Section Overview

We identified 20 eligible articles that addressed barriers and facilitators for uptake of CBT (n=13),[37,39-41,45,46,48-53,55] MBSR (n=5),[38,43,44,55,56] and ACT (n=4)[42,46,47,54] for chronic pain; 2 studies addressed more than 1 EBP.[46,55] Of these twenty, 9 reported only quantitative results,[37,39,41,46,50-53,55] 9 used purely qualitative methods,[40,42-45,48,49,54,56] and 2 used mixed methods.[38,47] All were rated moderate or high quality except 1.[44] The majority were studies conducted in the US (n=14; 6 within VA[37,39,41,46,50,51]), with the remaining 6 conducted in the UK (n=4),[40,42,47,49] Ireland (n=1),[54] and Australia (n=1).[48] The majority of articles (n=12), including most assessing CBT (n=9)[39-41,45,46,50,52,53,55] and all assessing ACT (n=4),[42,46,47,54] were conducted within effectiveness RCTs of the EBPs for chronic pain. MBSR, in contrast, was assessed outside of RCTs and in clinical contexts (n=4)[38,43,44,56] with the exception of 1 cost-effectiveness analysis.[55] Definitions of and inclusion/exclusion criteria for chronic pain varied across studies (Appendix Table G1).

Among the eligible articles examining barriers and facilitators, the majority (n=18) evaluated patient perspectives and experience of EBPs for chronic pain. Results mainly addressed the CFIR domain of Outer Setting (n=19),[37-54,56] including subdomains we developed to adapt the CFIR framework for best fit to the data: Patient Knowledge and Beliefs (*ie*, individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention) and Other Patient Attributes (*ie*, broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, priorities, competence, capacity, learning style, and other patient characteristics that do not fit under other patient-related domains). We added these new subdomains, along with others, to describe themes that were not captured by existing CFIR domains and subdomains. Several qualitative articles (n=10)[38,40,42-45,47,49,54,56] and 1 cost-effectiveness analysis[55] also addressed the domain of Intervention Characteristics, including subdomains we developed to adapt the CFIR framework for best fit to the data: Group Dynamics (*ie*, interactions during group therapy between participants or with facilitators that impacted patient experience and/or outcomes); and Patient-Therapist Dynamics (*ie*, interactions during one-on-one therapy that impacted patient experience and/or outcomes).

Below, we provide results by CFIR domains and subdomains, beginning with Outer Setting and then Intervention Characteristics. We also describe results from a few articles that addressed other CFIR domains. Detailed characteristics and results are found in Appendix Table G1.

Outer Setting

Patient Needs and Resources

Nine articles reported results addressing this subdomain: 4 for CBT,[40,45,48,49] 4 for MBSR,[38,43,44,56] and 1 for ACT.[47]

Two articles reported interview results from participants in telephone CBT (tCBT) programs.[40,45] Patients found that telephone delivery helped overcome barriers of geography and time, including balancing their work and childcare responsibilities.[40,45] Some also felt, however, that tCBT delivery limited face-to-face interactions and the depth of the patient-therapist relationship,[45] as in their view it did not include non-verbal communications or allow as personal or holistic a therapeutic approach compared with in-person care.[40] One study interviewed patients participating in group CBT, finding that patients couldn't use pacing skills when at home amid daily tasks.[48] Another study interviewed general practitioners (GPs) regarding chronic pain care for their South Asian patients; GPs felt that unaddressed needs were often psychosocial, that CBT would be helpful, and that culturally specific care and therapy in the patient's own language would be important.[49]

Participants in group MBSR studies found that other time commitments and responsibilities were an obstacle to participation, including work and caregiving or parenting.[38,44,56] In 1 small MBSR group, half (3 participants) thought an online program would help [with time commitments], while the other half preferred in-person sessions to foster program engagement.[44] In another group MBSR intervention, 59% of participants would have preferred more than 4 sessions, and 73% thought 90-minute sessions were just right.[38] This group's short format (4 sessions over 4 weeks) helped patients fit the program into their schedules and was less intimidating, but some found the duration too short to allow sufficient group bonding or to build the skills necessary to develop their own mindfulness routines.[38] Many group MBSR participants found that pain associated with lengthy seated meditation made groups harder to tolerate and was an obstacle to participation.[38,43,56] Some participants observed that participating in meditation despite discomfort helped them feel capable of doing activities despite pain.[56]

One study conducted interviews with participants in group ACT, finding that the sessions were cognitively, emotionally, and physically demanding; these qualities were substantial obstacles to sustained engagement and attendance. The duration and mode of delivery were especially difficult for participants to cope with, due to the need to be in classrooms and to sit in a hard chair for a long time.[47]

Patient Knowledge and Beliefs

To facilitate meaningful distinctions that best fit the data, we additionally divided this subdomain into 2 major themes: pain knowledge and beliefs, and therapy knowledge and beliefs.

Pain knowledge and beliefs

Four articles reported patients' pain-related knowledge and beliefs as barriers or facilitators for CBT (n=2)[40,45] and ACT (n=2).[42,54]

Some tCBT participants demonstrated a lack of understanding about pain triggers, which they believed related to a lack of clinical consensus on causes of chronic pain.[45] They saw pain as physical, a natural warning system responding to mechanical stress or dysfunction. They did not perceive control over pain episodes' beginning or end, so did not perceive control over future pain events happening. As they saw no clear relationship between their own behavior and the onset of pain, it was rare for them to have engaged in pre-emptive adjustment or pacing prior to the intervention. Accordingly, cognitive reflection enhanced their understanding of their own pain triggers and helped them shift emphasis from reactive to proactive pain management strategies.[45] Participants who attributed positive changes (in their subjective level of pain or their pain management) to tCBT reported higher self-awareness and self-management of symptoms and evidence of cognitive restructuring, such as changing the way they thought about pain: "put things in perspective," "think of others worse off," "focus less on the pain".[40]

Some group ACT participants found that fear of causing damage to themselves, and associated negative imagery, limited their ability to engage in acceptance.[54] Belief that a specific pain diagnosis or cure could be found was also a barrier to acceptance, while believing there was no specific cure facilitated acceptance.[54] Identifying psychological factors in pain expression helped give patients confidence to become more active and decatastrophize the impact of pain on their thinking and mood.[42]

Therapy knowledge and beliefs

Fourteen articles reported patients' therapy-related knowledge and beliefs as barriers or facilitators for CBT (n=8),[39,40,45,48,50-53] ACT (n=3),[42,47,54] and MBSR (n=3).[38,43,56]

Some tCBT participants initially felt that CBT did not fit their concepts of pain or pain experiences, and that psychotherapy questioned the validity of pain experience or implied that chronic pain is due to a character weakness needing correction.[45] In another tCBT intervention, about a third of participants had low expectations of tCBT, as they were skeptical that talking could affect their physical conception of pain.[40] Patients who had received CBT believed some people with chronic pain will be resistant to the idea that counseling may help prevent or manage chronic pain, and recommended clear information at screening about CBT principles and the link between physical pain symptoms and "what we do…the way we think."[40] Some group CBT participants felt that a group program can't suit individuals' complex pain experiences.[48]

An analysis of group CBT for pain and insomnia found that higher Treatment Acceptability (treatment made sense, is acceptable, is suitable, is expected to be effective) predicted higher treatment session attendance (ß .20, $p<0.05$).[52] Participants who eventually dropped out of another group CBT intervention recalled prior session material less accurately (effect size not reported (NR), $p<0.01$), recalled current material less accurately just after a session (effect size NR; $p<0.01$), and performed more poorly on homework (effect size NR; $p<0.05$) than completers.[53]

In 1 tCBT program, about a fifth of participants had a good understanding of CBT approaches based on prior CBT experience for other health conditions, reading, or their own professions, and many participants saw tCBT as a non-invasive, low-risk, "nothing to lose" alternative to medication.[40] Some, however, felt tCBT was not effective for them because they were already using CBT-informed pain management strategies prior to the intervention, including positive thinking and pacing. Participants thought tCBT would be most helpful for people with little or no prior experience of CBT for pain and recommended pre-intervention screening for CBT experience.[40] In another study of people who had participated in group CBT for pain in the past, CBT methods continued to provide a framework to facilitate positive change for some participants, while for others the concepts could not be adopted or maintained when living with chronic pain beyond the program.[48] Continuity appeared to be related to individuals' readiness to adopt cognitive behavioral beliefs and attitudes about pain. Some saw "not talking about pain" [avoidance of focus on pain, refocusing on self-efficacy and self-management] as a valuable way of managing their pain, while others thought it to be counter-productive to moving forward in the pain management process. Some participants thought CBT techniques felt like "brainwashing" and reinforcement seemed unnecessary: "it was all lectures and brain washing…they brainwash you, sieve you out and then bring you back. I just hope they've got rid of the silt…They take you on a journey, and then bring you back to all these cognitive sorts of phrases they use, and stages. And then you come back the next day and they'd come at it from another angle."[48]

Three articles reported patients' readiness for change as barriers or facilitators for CBT.[39,50,51] Two analyses of the same study data assessed roles of constructs comprising the Pain Stages of Change Questionnaire (PSOCQ) in relation to CBT adherence in a primary care setting.[39,50] In 1 analysis, higher Precontemplation, representing lower perceived personal responsibility for pain control and interest in pain-related behavior changes, was negatively associated with CBT adherence (% unique variance -0.301, $p<0.05$).[50] Higher Contemplation, representing increasing awareness of personal responsibility for pain control and interest in pain-related behavior changes, was positively associated with CBT adherence (% unique variance 0.370, $p<0.05$). Self-efficacy was not meaningfully or significantly predictive of adherence. In another analysis of the same study data, higher increase in a change score combining Action (acceptance of a self-management approach to chronic pain and engagement in efforts to improve pain management skills) and Maintenance (established self-management perspective and desire to continue learning and applying pain management skills) subscales was positively correlated with higher CBT adherence (r 0.34, $p <0.05$).[39] A foundational study of different data preceding these analyses observed that for CBT completers versus non-completers, pre-treatment mean scores were significantly lower for Precontemplation (2.93 vs 3.27, $p<0.05$) and higher for Contemplation (3.84 vs 3.61, $p<0.05$), and did not differ on Action or Maintenance scores.[51]

Some group ACT participants found the approach difficult to grasp: they couldn't see relevance to their pain experience, and found the content "wishy-washy…nothing concrete about it."[47] Participants in 1 group ACT program saw acceptance of present pain and limitations while committing to keeping as active and mobile as possible as key to self-management and as acquired from the program, along with the ability to use pacing skills to set consistent, realistic goals and the development of mindfulness strategies to train attention to the present moment.[42] Other group ACT participants developed a focus on creating openness to possibility that pain does not have to stop one from doing things, that one can set objectives based on one's values and view life in a different, more rewarding way.[47] In another group ACT program, participants eventually saw acceptance as the acknowledgement of the presence of pain, with the belief that life could still be lived despite pain.[54] Some participants in this program had initial strong emotional reactions, including anger and resistance, to the word "acceptance". Acceptance was associated with "giving up" for 1 patient: accepting pain would prevent her from moving forward with her life. Some moved from this resistance of acceptance toward a sense of expanded possibilities, associated with changes in both mindset and behaviors (*eg,* overcoming fear of increasing pain to engage in more exercise). Mindfulness was a component of this group ACT program, and participants understood its purpose as being in the present moment. Most found mindfulness to be of benefit, as it assisted with processing emotions and letting them pass; others "hated [it]…didn't get it."[54]

Some group MBSR participants wanted the program to have more focus on chronic pain, including how to control it and how to decrease medications.[38] Some wanted more information on anxiety, pain, and the mind-body connection, and some wanted more physical movement incorporated.[38] Participants in 1 group MBSR program found MBSR techniques (breathing, pausing, counting, slowing down) useful for relaxation and relieving pain, and were able to apply them with benefits beyond the practice time.[43] For participants in another group MBSR program, insufficient or inaccurate information about MBSR led some patients to believe that it would not be valuable: it was seen as "for people whose problems were in their head".[56] Some participants in this program found difficulty understanding the purpose of MBSR practices to be an obstacle: "I felt ignorant and embarrassed so that's why I quit." Some found the body scan practice problematic, as it identified more sites or types of pain, and seemed counter to some of their past impressions about pain ("that's what we're taught: resist the pain, not…approach and accept it") or avoidance strategies ("ignore it and not pay attention if it's there…if I can help it").[56] Some group MBSR participants were afraid that meditation in 1 position would not be helpful and would mean they were "just going to end up hurting real bad" because of their chronic pain and disabilities, even if they believed that "can't be the reason [the teachers] want us to do it."[56]

Other Patient Attributes

To facilitate meaningful distinctions that best fit the data, we divided this subdomain into 5 thematic categories: pain characteristics, pain treatments, values, religion, and age and other demographics.

Pain characteristics

Eight articles examined the impact of pain characteristics in uptake and attendance of CBT (n=7)[37,40,41,50-53] and ACT (n=1).[47]

Higher pain interference was associated with incomplete attendance of pain psychotherapies in 3 studies.[37,43,50] Non-completers of one-on-one CBT reported more baseline pain-related interference than completers in 1 study (mean West Haven–Yale Multidimensional Pain Inventory (WHYMPI-INT) 5.33 vs 4.64, $p<0.01$), but did not differ on pain severity, Global Pain Rating, pain-related disability, pain duration, state anxiety, or depressive symptoms.[50] In another study, one-on-one CBT completion was more likely among participants with lower baseline pain-related interference per WHYMPI-INT (OR 1.19, [95%CI 1.06, 1.34]), but completers and non-completers did not differ significantly on baseline pain severity, pain catastrophizing, depression severity or quality of life measures.[37] Higher baseline pain interference (brief pain inventory [BPI-I]) was associated with less frequent attendance of a group MBSR program (r -.357, p .045).[43]

In another group CBT study, as compared to people who attended at least 1 group CBT session, people who were eligible but attended no sessions had higher pre-treatment Pain Catastrophizing Scale scores (mean 38.9 vs 30.3, $p<0.01$) but did not differ on BPI-I, Roland-Morris Disability Scale (RMDS), Center of Epidemiological Studies Depression Scale (CESD) or quality of life (QOL). Completers did not differ from non-completers on any of these measures.[53]

In another one-on-one CBT study, completers and non-completers did not differ significantly on pain interference, or on pain severity, pain-related disability, pain behavior, pain duration, activity level, or depressive symptom severity.[51] In a one-on-one CBT study, participants who did or did not receive an adequate CBT dose (3 sessions) did not differ significantly in pain intensity.[41] In a one-on-one study of CBT for pain and insomnia, completers and non-completers did not differ significantly on several functional pain measures, pain catastrophizing, kinesiophobia, or on measures of anxiety, depression, insomnia, or objectively measured sleep.[52]

Participants in 1 telephone CBT program believed tCBT is most likely to be acceptable to people with presenting symptoms of musculoskeletal pain, and to people with low to moderate pain rather than severe pain.[40]

Group ACT participants who did not attend an adequate number of sessions did not differ significantly from attendees on primary pain location, pain-related disability, pain intensity, pain acceptance, acceptance, or quality of life measures.[47]

Pain treatments

Five articles reported patients' other pain treatments as barriers or facilitators for CBT (n=4[39,50-52]) and ACT (n=1[47]).

An analysis of group CBT for pain and insomnia found that opioid medication use at baseline predicted lower treatment session attendance (ß .21, $p<0.05$), but that current use of medication types including hypnotics, opioids, and non-opioid analgesics was unrelated to attendance.[52] Non-completers of one-on-one CBT did not differ from completers on pain medication use or history of pain surgery.[39,50] Non-completers of another one-on-one CBT intervention did not differ from completers on number of medical outpatient visits for pain, number of medical inpatient visits for pain, number of psychiatric visits, number of visits to other pain care providers, percentage of participants using prescribed or over-the counter pain medications, or percentage of participants receiving disability for pain.[51]

Many participants in 1 group ACT trial had experienced other interventions of multiple types that hadn't helped, and "were prepared to try anything that's offered that might help."[47]

Values

Some participants in 1 group ACT program noted that knowing their pain burdened family members was a motivation to get better.[54] Social interaction through re-engagement in valued activities (work, gatherings) helped participants become aware of the need to look after their own needs as well as those of family members or others. Some could identify their values but were not ready to move toward values-based action and continued to avoid experiences perceived to involve pain or discomfort.

Religion

Referring providers for 1 group MBSR intervention were reportedly concerned that MBSR would not be a good fit for patients with strong religious beliefs, but many participants reported that this was not an issue and most did not perceive any relationship between MBSR and their religion/spirituality.[56]

Age and other demographics

Ten articles addressed age and other demographics as barriers or facilitators for CBT (n=8),[37,39,41,46,50-53] ACT (n=2),[46,47] and MBSR (n=1).[43]

Completers of CBT for chronic pain in national VHA clinical settings were more likely to be older (OR for 1 year 1.01, 95% CI 1.002-1.023), but did not differ significantly from non-completers on gender, race, ethnicity, education level, or military service era.[37] As compared to people who completed a group CBT session focused on low literacy rural people with chronic pain, non-completers had lower mean income (under vs over \$13,000 annually, $p<0.01$; $\eta^2=0.105$) and fewer years of education (mean 11.8 vs 13.1, $p<0.02$), and did not differ significantly on achievement testing, age, or miles traveled to reach session sites.[53] An analysis of group CBT for pain and insomnia found that completers did not differ significantly from non-completers on age, sex, race, marital status, or education level.[52] Studies of one-on-one CBT completers and non-completers within RCTs found that they did not differ significantly in age, sex, race/ethnicity, years of education, living alone versus with others, employment status, retirement status, relationship status, or service connection[39,50]; age, race/ethnicity, or gender[41]; or age, education level, percent male (neither sex nor gender mentioned), or employment status.[51]

In a study of group ACT and group CBT, there was no significant difference across age groups in dropout percentage, number of sessions attended, treatment credibility, treatment satisfaction, or expectations of improvement with treatment.[46] In a group ACT program, participants who did not attend an adequate number of sessions did not differ significantly from attenders on age, years of education, gender, ethnicity, employment status, marital status, or number of medical comorbidities.[47] Some group ACT participants felt that older participants might be less open to the psychological orientation of the intervention: "for older people you need to talk their language… they've been through wars and what not…they just want someone to tell them either way."[47]

Attendance of 1 group MBSR program was not predicted by age, gender, ethnicity, living alone, or having a pre-existing relationship with the research team.[43]

Sex, gender, race and ethnicity were not defined in any included articles, either conceptually or in terms of data collection processes, and the accuracy of these terms as descriptors of analyzed data could not be confirmed.

Intervention Characteristics

Evidence Strength and Quality

One study reported that GPs in community UK practice were interested in culturally relevant CBT to help their South Asian patients with chronic pain. Study authors noted that most CBT clinical evidence comes from studies with people of European descent.[49]

Design Quality and Packaging

Five articles reported design quality and packaging as barriers or facilitators for CBT (n=2)[40,45] and MBSR (n=3).[38,44,56]

Participants in a telephone CBT intervention found that the self-management therapy materials provided to them for home use had useful functions as a memory aid for advice during sessions, a way to prompt and motivate daily goals, and a notebook for thoughts to discuss with their therapist at the next session.[40] Therapy materials helped participants understand mind-body connections and principles of CBT and helped identify pain triggers in order to identify solutions.[40] However, some participants found therapy materials repetitive, difficult to navigate, and too rigid as compared to the personalized and adaptable therapist approach, and thought the purpose and role of therapy materials in relation to therapist sessions was not clear enough at the outset.[40] Participants in another telephone CBT intervention felt that the self-help therapy materials' case studies and lifestyle scenarios focused on inactive, isolated people, which was an unwelcome reminder of potential identity loss that they wanted to avoid.[45]

Participants in a group MBSR intervention found that recordings and handouts helped people set up and adapt their mindfulness routines at home: "having a mobile set of tools helped me go with the flow about it".[38] Participants in another group MBSR intervention found that recordings of training sessions were helpful for viewing at an alternate time and that weekly messages encouraged mindfulness.[44] Participants of a group MBSR intervention wanted MBSR to be held in a space that was quiet, not "too crowded," and consistent.[56]

Cost

A cost-effectiveness study of group MBSR and group CBT versus usual care (UC) for chronic back pain found both MBSR and CBT to be cost-effective for increasing quality of life.[55] The mean one-year per-participant cost to society for MBSR was \$724 lower than UC (95% CI -\$4386, \$2778), and the mean one-year per-participant healthcare cost to the payer was \$982 lower than UC (-\$4108, \$1301). MBSR also yielded a quality-adjusted life years (QALY) gain of 0.034 (0.008, 0.060) and had a 90% probability of costing <\$50,000/QALY (the cost-effectiveness threshold) in societal cost-QALY bootstrap analyses. The mean 1-year per-participant cost to society for CBT was \$125 higher than UC (95% CI -\$4103, \$4347), and the mean 1-year per-participant healthcare cost to the payer for CBT was \$495 higher than UC (−\$2741, \$3550), yielding a QALY gain of 0.041 (0.015, 0.067). The incremental cost-effectiveness ratio for CBT over UC was \$3049/QALY, far below the \$50,000/QALY threshold for cost-effectiveness, and CBT had a 81% probability of costing <\$50,000/QALY in bootstrap analyses.[55]

Back pain-related healthcare costs showed the same pattern as seen in overall healthcare costs: a trend toward increase in healthcare costs over UC for CBT and a trend toward reduction for MBSR. Both CBT and MBSR trended toward reducing non-back related healthcare costs compared to UC. There were no significant differences between MBSR and UC, between CBT and UC, or between MBSR and CBT in patient copay amounts or in total societal costs (total overall healthcare costs + patient copay amounts + lost productivity from absenteeism + lost productivity from presenteeism). There were no significant differences between MBSR and UC, or between CBT and UC, in health care utilization (all office-based and outpatient care, emergency department visits, hospital inpatient stays, pharmacy prescriptions, imaging visits) or productivity losses (absenteeism lost hours, presenteeism lost hours).[55]

Group Dynamics

Six articles addressed group dynamics as barriers or facilitators for ACT (n=3)[42,47,54] and MBSR (n=3).[38,43,56] No CBT interventions in included studies had a group format.

Participants in group ACT interventions appreciated the ability to express emotions freely in a non-judgmental atmosphere, felt solidarity with chronic pain patients “in the same boat,” and felt empathy and emotional support from the group as other participants validated their difficulties.[42,54] The group enabled participants to share best ways of managing pain, including practical self-management strategies and specific pain [treatments], and helped participants identify non-coping areas, offering a “wake up call” to challenge negative thinking or identify ways in which they were “stuck”.[42] Comparison with others in the group helped participants reframe their pain-related challenges and increase motivation to cope with pain.[47] Hearing others’ perspectives within the group facilitated some participants’ identification of values and subsequent values-based action.[54] Participants valued the group facilitators’ emotional attitude (relaxed, non-judgmental, and understanding) and use of techniques and adaptations to help the group understand and apply concepts.[42]

Participants in group MBSR interventions also appreciated group social support, felt less isolated in their pain experience[38] and valued the ability to talk with people with similar experiences.[43] Sharing with the group also helped participants feel better about their challenges in learning mindfulness.[38] Some, however, felt the group detracted from their experience and would have preferred a one-on-one format for MBSR.[38] Mixed-gender groups were difficult for some women with histories of sexual assault, and women-only group options were suggested.[56] Participants sometimes felt the facilitator would ask them to be quiet too often, and that more conversation with group members with similar experiences would have been better.[43] Participants in a military Veterans' group, however, could become frustrated by other group members discussing topics they viewed as irrelevant, such as military service, and appreciated when facilitators could structure and control the group; they felt teachers' lack of military service and unfamiliarity with Veteran culture made them reluctant to provide limits and accountability in group discussion.[56] Many patients were able to minimize pain and accommodate disabilities by making adjustments to standard seated meditation. Sometimes the MBSR teacher aided in this process; at other times participants felt "the instructors need to be a little bit more open-minded… some of us have to stretch a certain way or move a certain way."[56]

Patient-Therapist Dynamics

Two studies addressed patient-therapist dynamics as barriers or facilitators for CBT.[40,45] No ACT or MBSR interventions in included studies had a one-on-one format.

Participants in tCBT thought that direct interaction with the therapist enabled them to compare daily routines and activity levels against social norms and identify self-care opportunities.[45] Patients appreciated having someone to share their pain experience with, which made the experience less isolationg, and felt that tCBT was an opportunity to talk and be heard, as opposed to GP care.[40] Therapists were viewed as friendly, knowledgeable, empathic, and able to quickly establish rapport, and speaking to the same therapist each session felt consistent, reliable, and convenient.[40]

Other CFIR Domains

Additional results from 1 article addressed Inner Setting, Readiness for Implementation—Available Resources, and Characteristics of Individuals, Knowledge and Beliefs.[49] Regarding available resources, GPs in a community UK practice noted that there are not enough trained counsellors with South Asian language skills and relevant cultural understanding to provide culturally informed CBT.[49] For knowledge and beliefs about CBT, GPs also noted they had limited understanding of what CBT approaches existed and were available. GPs had some understanding of how CBT could help pain, but felt current provision was limited, inadequate and culturally inappropriate for some South Asian patients.[49]

CBT FOR INSOMNIA, SUD, AND OCD: BARRIERS AND FACILITATORS (KQ 2A)

Key Results

- Barriers in VHA and non-VA settings included:
    - Deficits in resources including lack of protected time to deliver treatment, lack of training of referring providers, no centralized source for educational information, and limited availability of trained providers
    - Lack of provider knowledge about EBPs

  - Patient factors related to comorbid mental health conditions, cognitive barriers to understanding CBT concepts, cultural/language barriers, transportation barriers
- Facilitators in VHA and non-VA settings included:
  - Scalability and convenience of CBT tools and resources
  - Local champions and leadership support
  - Strong networks/communication across clinics and teams

Section Overview

Among evidence addressing provider- and system-level barriers and facilitators to uptake of EBP for chronic mental health conditions, we identified 5 eligible articles on CBT for insomnia (n=3),[57,59,64] SUD (n=1),[97] and OCD (n=1).[98] The 3 articles on CBT for insomnia (CBT-I)[57,59,64] addressed persistent barriers and facilitators approximately 10 years after VHA national training initiatives for CBT-I were first launched (Table **4**). One article reported interview, focus group, and survey data from general practice and mental health providers in Australia regarding barriers and facilitators for CBT for OCD.[98] One article reported interview results from mental health providers regarding barriers and facilitators to use of CBT for SUDs; providers worked at US community-based addiction treatment organizations that had received a grant award to implement EBPs.[97] Results for these 5 articles mainly addressed domains of Inner Setting, (Readiness for Implementation—Available Resources), and Characteristics of Individuals, (Knowledge and Beliefs about the Intervention). Detailed characteristics and results for these articles are found in Appendix Table G2.

Inner Setting

All 5 articles addressed Readiness for Implementation; specifically, Available Resources were reported as barriers or facilitators to implementation of CBT.[57,59,64,97,98] One reported that “Most primary care physicians were satisfied with CBT-I resources in their facility.”[59] The remainder reported deficits in resources related to time, training, educational information, and availability of providers.[57,64,97,98] In 1 quantitative study with primary care providers (PCPs) that asked, "On a scale of 1 to 10 where 1 = not at all satisfied and 10 = very satisfied, how satisfied are you with the opportunities available to you for training in the assessment and diagnosis of sleep disorders?”, the modal response to this question was 5 (33.3% of respondents), suggesting some dissatisfaction with training opportunities.[64] Two articles addressed Access to Knowledge and Information.[59,98] For example, 1 reported, “Several primary care physicians expressed the desire for a more centralized resource to learn about CBT-I and make referrals.”[59] One article addressed Leadership Engagement: “two key facilitators…contributed to a successful implementation and widespread dissemination of CBT-I: local champions and leadership support.”[59]

One article addressed Implementation Climate—Relative Priority, stating: “The general consensus among physicians was that sleep took a ‘backseat priority’ in complex patients and was not prioritized by patients or providers.”[59]

One article addressed Networks and Communication, finding that “strong connections between primary care clinics, Primary Care Mental Health Integration (PCMHI) teams, and sleep medicine clinics increased utilization of CBT-I.”[59] One article addressed Provider Decision-making, with a primary care provider stating: “I like sending them out to PCMHI because I secretly hope they will address some of their underlying mental health issues.’”[59] One article addressed Patient-Provider Relationships, finding that “patients were more willing to engage if 1) a known primary care provider facilitated an introduction or 2) the CBT-I provider reached out to them.” [57]

Characteristics of Individuals

All articles identified provider factors in the subdomain Knowledge and Beliefs about the Intervention as barriers or facilitators to implementation of CBT.[57,59,64,97,98] For example, regarding evidence for CBT-I, 1 provider reported, “I have been educated in research talks from an expert in the area…I believe it is effective based on what I have heard.”[59] Studies also found that both patients and providers emphasized the importance of provider knowledge about CBT. For example, “Several patients pointed out that providers need to be informed about CBT-I to answer patient questions and facilitate referrals”[57] and “Psychologists reported themselves as knowledgeable about OCD…also stressed importance of GP support in ongoing care and management of people with OCD”.[98] A quantitative study with PCPs reported that the majority of respondents had some level of familiarity with CBT-I (82.3%). However, a small percentage of respondents (15.7%) had never heard of it. [64]

Other CFIR Domains

Two articles addressed Intervention Characteristics (Adaptability), finding that providers appreciated the scalability and convenience of CBT in primary care settings[59] and patients appreciated the ability to use multiple therapeutic tools and resources across different settings (*eg*, accessing therapy materials through workbooks at home and electronic applications when travelling).[57] Two articles reported results pertaining to Outer Setting; 1 of these indicated that cultural/language barriers and transportation barriers led to poor attendance (Patient Needs and Resources).[97] This study also identified factors within Other Patient Attributes, including cognitive barriers to understanding CBT concepts, and comorbid mental health conditions (*eg*, anti-social personality disorder).[97] The other article also addressed Other Patient Attributes, finding hesitancy to commit to provider-delivered CBT among patients without a history of mental health treatment.[57]

Table 4. Barriers and Facilitators for Uptake of CBT, MBSR, and ACT for Chronic Pain and Chronic Mental Health Conditions—Results by CFIR Domains

	CBT (19 articles)[24,37,39-41,45,46,48-53,55,57,59,64,97,98]	MBSR (5 articles)[38,43,44,55,56]	ACT (4 articles)[42,46,47,54]
I. Intervention Characteristics	**Evidence Strength & Quality** • GPs interested in culturally relevant CBT for South Asian patients; authors note most CBT clinical evidence comes from European populations[49] **Design Quality and Packaging** • Self-management therapy materials helped understand principles and prompted use of skills, but could be repetitive and unclear in purpose with dispiriting case studies[40,45] **Adaptability** • Providers and patients appreciated scalability and convenience of CBT tools[57,59] **Cost** • CBT was cost-effective for improving quality of life and was not significantly different from UC in health care utilization or productivity losses[55] **Patient-Therapist Dynamics** • Patients appreciated therapists for empathic, consistent, reliable care[40,45]	**Design Quality and Packaging** • Recordings and handouts helped patients adapt their routine for home use[38,44] • Patients wanted MBSR to be held in quiet, uncrowded, consistent space[56] **Cost** • MBSR was cost-effective for improving quality of life and was not significantly different from UC in health care utilization or productivity losses[55] **Group Dynamics** • Patients in MBSR group appreciated social support, talking with people with similar experiences, structure and control was important[38,43,56]	**Group Dynamics** • Patients in ACT group appreciated non-judgmental atmosphere, support from other participants, different perspectives[42,47,54]
II. Outer Setting	**Patient Needs & Resources** • Cultural/language, transportation barriers led to poor attendance[97] • Need for culturally specific care and therapy in patient's language[49] • Telephone CBT increased accessibility, eliminated time/geographical barriers[40,45]	**Patient Needs & Resources** • Patients in MBSR group reported time commitment and responsibilities, physical pain during lengthy seated meditation were obstacles to participating[38,43,44,56]	**Patient Needs & Resources** • Group ACT sessions too cognitively, emotionally, physically demanding[47] **Patient Knowledge & Beliefs about Intervention**

	CBT (19 articles)[24,37,39-41,45,46,48-53,55,57,59,64,97,98]	MBSR (5 articles)[38,43,44,55,56]	ACT (4 articles)[42,46,47,54]
	• Pacing skills learned during treatment were difficult to use at home[48] **Patient Knowledge & Beliefs about Intervention** • CBT increased understanding of pain triggers[45] • Some patients had difficulty accepting mental health treatment for what they perceived as physical condition[40,45,48] • Treatment acceptability predicted session attendance[52] • CBT adherence related to stages of change[39,50,51] **Other Patient Attributes** • Cognitive barriers to understanding therapy, comorbid health conditions, and no history of mental health treatment led to poor engagement[57,97] • Baseline pain interference,[37,50] catastrophizing,[53] opioid use[52] were associated with lower attendance in some but not all studies[39,41,51] • Patient demographics generally not related to attendance[39,41,46,50-53]	• Online and shorter sessions may eliminate barriers[38,44] **Patient Knowledge & Beliefs about Intervention** • Desire for increased focus on how to control pain, concern about meditation position increasing pain, and desire for more movement[38,56] **Other Patient Attributes** • Baseline pain interference associated with less frequent attendance[43] • Patient demographics generally not related to attendance[43] • Patients don't see religion/spirituality as barrier to MBSR[56]	• Fear of causing damage and focus on specific pain diagnosis/cure limited engagement [54] • Identifying psychological factors in pain helpful[42] • Content did not seem relevant to pain[47] • Mindfulness and acceptance controversial concepts[54,56] **Other Patient Attributes** • Patients who did not attend sessions did not differ on pain location, intensity, or distress[47] • Pain as burden to family members was motivation to engage[54] • Patient demographics generally not related to attendance[46,47]
III. Inner Setting	**Networks & Communication** • Strong connections between clinics and teams increased utilization CBT-I[59] **Implementation Climate:** • **Relative Priority** – Sleep assessment and treatment took backseat priority[59]		

	CBT (19 articles)[24,37,39-41,45,46,48-53,55,57,59,64,97,98]	MBSR (5 articles)[38,43,44,55,56]	ACT (4 articles)[42,46,47,54]
	Readiness for Implementation: • **Leadership Engagement** – Local champions and leadership support contributed to successful implementation[59] • **Available Resources** – Deficits in resources related to time, training, educational information, and availability of providers[57,64,97,98] – Need for trained providers with South Asian language skills and cultural understanding[49] • **Access to Knowledge & Information** – Need for centralized resources for information, including psychoeducation and guidelines for providers[59,98] **Provider Decision-making** • Provider likes connecting patients with mental health for sleep treatment so other issues can be addressed[59] **Patient-Provider Relationships** • Patients more willing to engage in CBT if known provider made referral or CBT provider reached out to them[57]		
IV. Characteristics of Individuals	**(Provider) Knowledge & Beliefs about Intervention** • More provider education necessary for answering patient questions, facilitating referrals, ongoing care and management[49,57,59,64,97,98]		

ACT = acceptance and commitment therapy; CBT = cognitive behavioral therapy; GP= general practitioner; MBSR = mindfulness-based stress reduction; QALY = quality-adjusted life year

CBT FOR CHRONIC PAIN, DEPRESSION, ANXIETY, INSOMNIA, AND PTSD, AND ACT FOR DEPRESSION: EFFECTS OF IMPLEMENTATION STRATEGIES (KQ 1B + KQ 2B)

Key Results

- EBPs demonstrated large effects on symptom reduction and improvements in quality of life.
- Over 80% of mental health providers completed VHA national trainings, but it is unclear if trainings increased reach and adoption (*eg*, uptake by target patient populations and use by relevant clinical staff, proportion or representativeness of settings and staff).
- Increased provider self-efficacy and improved perceptions of EBP after VHA training programs.
- It is unclear if there is added benefit for external facilitation.
- Findings related to maintenance of EBPs following VHA training initiatives (*ie*, after consultation phase) were modest, with continued barriers including competing professional time demands and patient barriers (*eg*, distance from clinic, missed appointments).

Section Overview

Among 12 articles addressing CBT for chronic pain (n=1),[24] depression and/or anxiety (n=7),[81,86,88-90,93,94] insomnia (n=2),[85,92] and PTSD (n=1),[83] and ACT for depression (n=1),[84] nearly half evaluated VHA national initiatives to implement these therapies (n=5)[24,84,85,92,93] (Table 3). These articles evaluated pre-training to post-training outcomes following VHA national training initiatives for CBT for chronic pain,[24] CBT for depression,[93] CBT-I,[85,92] and ACT for depression.[84]

Implementation Strategies Evaluated

We identified 4 distinct groups of implementation interventions: 1) training/education, facilitation, and audit/feedback, 2) training/education and audit/feedback, 3) training/education, and 4) access to new funding. First, we classified the implementation strategies employed in VHA implementation of CBT and ACT as training/education, facilitation, and audit/feedback. This classification was based on ERIC definitions,[33,34] in which training/education means provision of provider educational resources, facilitation is interactive support provided by internal or external individuals (*eg*, centralized VHA training initiatives to provide resources and support to individual sites), and audit/feedback is collection and summary of clinical performance data (*eg*, fidelity measures, recommendations during consultation) given to administrators or clinicians to modify behaviors and enhance fidelity. VHA implementation of CBT and ACT involved structured programs of in-person workshops (2-3 days) followed by 6 months of weekly consultation with experts. For their consultation sessions, trainees were required to submit audio-recordings of therapy sessions with patients, which were rated for fidelity. VHA provided facilitation through centralized resources and support.

In addition to VHA national training initiatives, we included an additional 3 articles under the classification of training/education, facilitation, and audit/feedback.[86,88,89] These articles were also VHA training initiatives that included training, internal or external facilitation, and audit/feedback, but were not part of the VHA national training initiatives. Two articles reported on the same VHA study evaluating pre-post outcomes following implementation of regional training for CBT for depression.[88,89] This training included a 1.5-day CBT workshop and biweekly follow-up group telephone consultation calls for participants over 12 weeks. In addition, 12 therapists at 10 sites were randomly assigned to receive external facilitation. The facilitator met with them at least monthly after the workshop for 6 months to discuss setting individual goals for CBT implementation, attempting CBT quickly, and reinforcing all efforts to get started. Later calls focused on maintaining motivation and overcoming barriers to achieving individual goals. In addition to scheduled calls, the facilitator received and responded to individual questions and sent email announcements and reminders to the group.[88,89] One article also reported a pre-post VHA pilot study implementing brief CBT in primary care for depression and anxiety.[86] Mental health providers were given access to an online training program to complete at their own pace, expected to take approximately 8 hours. Expert clinicians audited patient session audio recordings and provided written and/or verbal feedback regularly, with 2-4 randomly extracted session recordings reviewed in 4- to 6-month intervals. External facilitators (*ie*, members of the project staff) regularly engaged study clinicians and clinic leadership through regular group meetings and email. Internal facilitators (*ie*, local directions of Primary Care Mental Health Integration [PCMHI]) addressed site-specific clinician and system concerns collaboratively with external facilitators.

In the second group, there were 2 articles which evaluated training/education and audit/feedback, but did not explicitly state the use of internal or external facilitation and were not supported by VHA national initiatives. One article evaluated training US community addiction counselors to deliver group CBT for depression; counselors received 2 days of didactic training and weekly group supervision over 2.5 years, including review of audiotapes and feedback to improve adherence.[90] The other study trained providers on CBT skills for treating PTSD patients, using 3 internet-based training modules combined with weekly consultations via telephone for 6 weeks.[83]

Finally, 1 study evaluated online training/education for CBT for depression for VHA SUD program counselors,[81] and another examined access to new funding to facilitate implementation of mental health treatments at primary care sites.[94] This latter study involved 2 primary care demonstration sites for the Improving Access to Psychological Therapies (IAPT) initiative of the UK National Health Service (NHS). IAPT provided financial resources to improve access to mental health treatments in primary care.[94]

Below, we summarize results organized by these 4 groups based on implementation strategies. Detailed characteristics and results are found in Appendix Table G3.

Training/Education, Facilitation, and Audit/Feedback

Eight articles evaluated VHA training programs for CBT (n=7)[24,85,86,88,89,92,93] and ACT (n=1),[84] using survey data from trainees and those who completed training, and information about patients treated by providers who were trained by these programs. Evaluation of CBT-CP involved 71 trained mental health providers across VHA facilities (48 psychologists, 19 social workers, and 4 nurses); of these, 84.5% (n = 60) met all training program requirements.[24] Evaluation of the national training program for CBT for depression involved 221 therapists who participated in workshops and consultation; 82% (n= 182) met all training program requirements.[93] Evaluation of the national training program for CBT-I reported data from 207 trained therapists across 6 cohorts, with 93% (n = 193) having met all training program requirements.[85,92] For national implementation of ACT for depression, 391 therapists were trained, with 85% (n = 334) completing training program requirements.[84] The regional implementations of CBT for depression involved 28 mental health providers in 1 study,[88,89] and 9 PCMHI providers at 2 VHA sites in the other (4 providers completed all training modules).[86] These studies reported outcomes addressing Effectiveness, Adoption, Implementation, and Maintenance. No articles in this classification group reported on reach.

Effectiveness

For patients treated with CBT-CP, there was a large reduction of pain catastrophizing (Cohen's d = 0.81); moderate reductions in pain interference (Cohen's d = 0.57) and depression (Cohen's d = 0.53), and moderate improvement in quality of life (Cohen's d = 0.45); and a small reduction in pain intensity (Cohen's d = 0.22 to 0.26).[24] For patients who received CBT for depression, there was a large reduction in depression (Cohen's d = 0.80) and moderate improvement in quality of life (Cohen's d = 0 .39 to 0.74).[93] Patients who were treated with CBT-I had large reductions in insomnia symptoms (Cohen's d = 2.2); moderate reduction in depression (Cohen's d = 0.60); and small to large improvement in quality of life across domains (Cohen's d = 0.34 to 0.87).[85] Patients who received ACT for depression had moderate improvement in quality of life across domains (Cohen's d = 0.40 to 0.61) and reduction in depression symptoms ($p < 0.001$).[84]

Adoption

We categorized reported outcomes regarding provider attitudes and self-efficacy as Adoption. For providers trained in CBT for depression, improvement in general psychotherapy self-efficacy was found post-consultation ($p<0.001$), and higher CBT-specific self-efficacy was noted post-workshop and post-consultation ($p<0.001$ for both comparisons).[93] Additionally, providers had increases in positive attitudes toward CBT post-workshop and post-consultation ($p<0.001$ for both comparisons). Providers who underwent training for CBT-I had increases in general psychotherapy self-efficacy post-consultation ($p<0.001$), and CBT-I specific self-efficacy post-workshop and post-consultation ($p<0.001$ for both comparisons).[92] There were also increases in positive attitudes toward CBT-I post-workshop ($p<0.001$), with no further increase after consultation. Providers trained in ACT for depression had increased self-efficacy for general psychotherapy post-consultation ($p<0.001$), and higher ACT-specific self-efficacy post-workshop and post-consultation ($p<0.001$ for both comparisons).[84] Therapists' attitudes toward ACT were also more positive post-workshop ($p<0.001$), with no further increase after consultation.

One study evaluated regional training for CBT for depression, finding that therapists who received facilitation had a mean increase of 19% in self-reported CBT use from baseline (vs control mean increase of 4%), but this was not statistically significant.[89] There was also no added benefit for facilitation in terms of CBT-specific knowledge, skill, or ability at 3 months post-workshop when compared with those who did not receive facilitation.[88] There was improvement in providers' CBT knowledge post-workshop ($p<0.01$), and increased use of certain CBT skills at 3 months post-training, including orienting patients to CBT (p=0.003), setting goals (p=0.002), and behavioral activation (p=0.01).[88]

Implementation

Five articles reported on implementation fidelity, as assessed by review of audio-recorded patient sessions. Providers trained in CBT-CP showed higher ratings on competency for the second patients they treated, compared with the first ones (Cohen's d = 0.34, p=0.003).[24] Similarly, providers had increased competency ratings for CBT for depression, in comparing later sessions to initial ones for their first treated patients (Cohen's d = 0.79).[93] The study of CBT-I found competency scores were significantly higher on providers' last therapy sessions compared to the first therapy sessions for the first patients, and on the second patient's tapes compared with first patient's tapes.[85] The study for ACT for depression found the percentages of therapists who achieved as score indicative of core ACT competencies during the initial, middle, and later phase of training were 21%, 68%, and 96%, respectively, and that all sub-scale scores improved significantly during consultation.[84] In evaluating the fidelity of brief CBT for depression and anxiety, the majority of audio-recorded sessions were rated acceptable for treatment adherence and skillfulness.[86]

The evaluation of regional training for CBT for depression reported that the facilitator spent 25 hours in facilitation-related activities.[89] Therapists spent a total of 26.5 hours in direct contact with the facilitator. The total cost for personnel time (facilitator and 12 therapists) was $2,458.80 over 7 months. Regarding barriers to using CBT, qualitative interviews identified 4 common themes: lack of control over the clinic schedule; rejection of CBT due to difficulty and inflexibility; therapist duties; and poor communication between therapists and clinical leadership.

Maintenance

In surveys 6 months after completion of consultations, therapists reported using CBT-CP with approximately two-thirds of the patients they treated.[24] About three-quarters adhered to the protocol, including use of outcome measures to assess progress. Providers agreed that CBT-CP was effective, were likely to recommend it to Veterans, and reported that their treatment approach had changed more towards a CBT model. Similarly, provider surveys 6 months after consultation for CBT-I training showed that 74% had used CBT-I during the previous month, with mean of 3.4 (SD 5.3) patients seen per provider.[92] The most common challenges to continued use of CBT-I were competing professional demands and patient factors (*eg*, no-shows and patients' distance from clinic).

Evaluation of national training program for CBT for depression included provider surveys 3-12 months after consultation, finding a mean of 19 (SD 22.3, range 0–140) patients were treated since completion of training.[93] Additionally, surveys of providers 3-12 months after training for ACT for depression showed they were using ACT with approximately 39% of the patients they treated with depression in the month prior.[84] However, given the wide range in duration post-training for both of these studies, it is unclear whether there was sustained use of CBT or ACT for depression by providers.

Training/Education and Audit/Feedback

Of 2 studies using training/education and audit/feedback, 1 evaluated outcomes for implementing group CBT for depression in non-VA community addiction programs.[90] For 5 trained addiction counselors, implementation fidelity was assessed using ratings of audio-recorded sessions; the average adherence rate was 94% across all coded sessions (total 80), suggesting high adherence to the treatment.[90] The average competence score across all coded sessions was 4.1, which authors reported as indicating counselors were competently delivering CBT.[90] For reach, survey data from patients who received CBT indicated positive experiences and perceptions of group CBT. For example, 86% indicated that they "strongly agree" they could use information from the group in their daily life, and 83% reported exercises conducted in the group were helpful.[90]

The other study involved 139 VHA mental health providers who were randomized to training in CBT skills for treating PTSD (n=46 internet modules only, n=42 internet modules and weekly consultation), or no training (n=51).[83] In surveys of provider knowledge and self-efficacy, providers in either training arm had greater increases post-training compared with no training group (*eg*, mean difference on self-efficacy was 1.28 for internet and consultation group, compared with 0.21 in no training group). Improved motivation enhancement and behavioral task assessment skills, as assessed using standardized patient encounters, were also noted for both training arms, with stronger effects for those who had internet modules and consultation.[83]

Training/Education

Eight volunteer counselors (at 7 VHA SUD programs) completed online training for CBT for depression.[81] They reported concerns regarding implementation resource barriers: "I'm going to have to do the group [alone]… I don't think I'm going to have a co-facilitator." Additionally, counselors indicated they would adapt group CBT such that patients could be admitted on an open basis. Regarding reach, counselors indicated concerns about patient needs and that complexity of clinical presentation necessitated resources beyond standard CBT.

Access to New Funding

The other study evaluated outcomes at 2 primary care demonstration sites for IAPT (UK NHS initiative).[94] We focus here on the results for the Newham site which delivered in-person CBT for depression or anxiety to a majority of referred patients; the other site provided mostly self-guided resources. For reach, 24% of referred patients (249 of 1043) attended at least 2 sessions (*ie*, received some treatment beyond initial assessment).[94] There were also more black individuals among self-referrals for CBT (22%), compared with those referred by their GPs (16%). Regarding effectiveness, the study found significant improvements in depression (Cohen's d = 1.06) and anxiety (Cohen's d=1.26) from initial assessment to last available session for patients who had at least 2 sessions.[94]

Table 5. Outcomes for Implementation of CBT and ACT—Results by Implementation Strategies and RE-AIM Categories

	Training/Education, Facilitation & Audit/Feedback (8 articles)[24,84-86,88,89,92,93]	Training/Education & Audit/feedback (2 articles)[83,90]	Training/Education (1 article)[81]	Access to New Funding (1 article)[94]
Reach		• Patients felt CBT groups and resources were helpful and understandable[90]	• Due to patient complexity, CBT may not be enough to help patients	• 24% of the patients referred (249 of 1043) attended ≥2 CBT sessions • More black individuals among self-referrals (22%) for CBT vs those referred by GPs (16%)
Effectiveness	• ↓ chronic pain symptoms with CBT-CP [24] • ↓ insomnia symptoms for CBT-I [85] • ↓ depression/anxiety symptoms with CBT-CP,[24] CBT for depression,[93] CBT-I,[85] and ACT for depression[84] • ↑ quality of life for CBT-CP,[24] CBT for depression,[93] CBT-I,[85] and ACT for depression[84]			• ↓ depression/anxiety symptoms for treated patients
Adoption	• ↑ provider self-efficacy for general and CBT-specific skills after training[84,92,93] • ↑ provider positive attitudes toward CBT after training[84,92,93] • ↑ utilization, knowledge and ability for specific CBT procedures after training, no added benefit from facilitation[88,89]	• ↑ knowledge and self-efficacy for CBT after training, with added benefit from consultation following training[83]		
Implementation	• ↑ provider competency in CBT after training[24,86,92,93] • ↑ provider competency in ACT after training[84]	• Mean provider adherence rate of 94% and demonstrated competence after CBT training [90]	• Providers need to do CBT group alone due to lack of co-facilitator, and would adapt CBT	

	Training/Education, Facilitation & Audit/Feedback (8 articles)[24,84-86,88,89,92,93]	Training/Education & Audit/feedback (2 articles)[83,90]	Training/Education (1 article)[81]	Access to New Funding (1 article)[94]
	• Barriers to using CBT—lack of control over schedule; provider rejection of CBT due to difficulty and inflexibility; therapist duties; and poor communication between therapists and leadership[88]	• ↑ provider skills ratings for CBT (for PTSD) after training, with added benefit of consultation [83]	group to admit patients on an open basis [81]	
Maintenance	• 6 months post-training, 66% of providers were using CBT-CP [24] • 6 months post-training, 74% of providers were using CBT-I with patients, mean of 3.4 patients seen by each[92] • 3-12 months post-training, providers reported using CBT for mean of 19 patients (range 0-140) [93] • 3-12 months post-training, providers were using ACT with approximately 39% of patients with depression in the month prior [84] • Common challenges to use of CBT-I—competing professional demands and patient factors (*eg*, patients' distance from clinic)[92]			

ACT = Acceptance and Commitment Therapy; CBT = Cognitive Behavioral Therapy; CBT-CP = Cognitive Behavioral Therapy for Chronic Pain; CBT-I= Cognitive Behavioral Therapy for Insomnia; GP=general practitioner; PTSD=Posttraumatic Stress Disorder

TRAUMA-FOCUSED PSYCHOTHERAPIES FOR PTSD—CPT AND PE: BARRIERS, FACILITATORS, AND EFFECTS OF IMPLEMENTATION STRATEGIES (KQ 2)

Key Results

- VHA national training programs improved provider perceptions about and self-efficacy for CPT/PE, but persistent barriers in VHA settings limited reach and adoption.
- Barriers in VHA settings included:
    - Inflexibility and lack of adaptability of CPT/PE protocols
    - Provider workload and scheduling challenges
    - Complexity, comorbidities, and other competing needs of Veterans in VHA
    - Complex referral processes that were burdensome and appeared redundant to patients
    - Patients' (and their social networks') negative perceptions about VHA care, whether due to direct experience or media reports
- Facilitators in VHA settings included:
    - Strong VHA support for training
    - Perceived effectiveness of CPT/PE for patient outcomes
    - Perceived benefits for clinic scheduling and provider morale
    - Patients' positive experiences and relationships with providers in general and those who made referrals for treatments
- In non-VA community settings, mental health providers generally had low concern for barriers and thought that CPT/PE were compatible with their current work, but few had been trained in CPT/PE.
- Non-VA providers who underwent a training program for CPT/PE reported higher self-efficacy post-training, along with use of CPT/PE at 3 (58%) and 6 months (64%).

Section Overview

Among 25 articles addressing CPT and/or PE, the majority evaluated VHA national initiatives to implement these therapies (n=7)[76-78,80,82,87,91] or persistent barriers and facilitators to their use in VHA settings (n=12),[58,60-62,65,67-71,101,102] often 10 years or more after these initiatives were first launched (Table 6 and Table 7). One article reported only pre-training survey results from mental health providers enrolled in the VHA national PE training program.[72] VHA implementation of

CPT and PE began in 2006 and 2007, respectively, and involved structured programs of in-person workshops (2-4 days) followed by 6-9 months of weekly consultation with experts. Consultants were nationally designated trainers that initially included individuals who had developed these therapies.[72,91] For their consultation sessions, trainees were required to submit records of therapy sessions with patients, either session notes or audio-recordings. We classified the implementation strategies employed in these national VHA programs as training/education, facilitation, and audit/feedback.

Additionally, 2 articles reported evaluations within VHA settings of different strategies to increase patient uptake and adherence — 1 developed a new referral process for CPT/PE that included 1 session of CBT delivered by PCMHI providers.[75] This article also reported on stakeholder interviews with primary care and mental health leadership regarding barriers and facilitators to uptake of CPT/PE, which provided the rationale for development of specific referral processes.[75] A second study examined outcomes associated with preparatory psychoeducation groups for patients not ready to undergo CPT/PE.[73] Finally, 3 articles evaluated CPT/PE in non-VA community settings: 1 article evaluated outcomes of CPT/PE implementation[74] and 2 articles addressed barriers and facilitators among community providers.[63,66] Similar to VHA program for implementing CPT/PE, the implementation program for community providers involved 2-day workshops (on CPT or PE) followed by 6 months of expert consultation that involved reviewing 3 audio-recorded patient sessions for each trainee.[74]

Below, we first summarize results for articles addressing CPT/PE in VHA settings, and then describe remaining studies in non-VA community clinics. As in other sections, we group outcomes of implementation strategies by RE-AIM, and results on barriers and facilitators using the CFIR framework. Detailed characteristics and results for these articles are found in Appendix Table G4 and Appendix Table G5.

Outcomes of VHA National Implementation for CPT and PE

Seven articles evaluated the VHA national training programs using surveys of mental health providers who were participating or who had completed training (Table 6).[76-78,80,82,91] Some articles also reported patient outcomes (obtained from the medical record or submitted during consultation) for those treated by these providers.[77,82,87,91] Reported outcomes largely addressed Effectiveness, Adoption, Implementation, and Maintenance.

Effectiveness

Four articles described reduction in severity of PTSD symptoms for patients who were treated by mental health providers either trained or undergoing training in CPT/ PE.[77,82,87,91] PTSD symptoms were assessed using the PTSD Checklist (PCL), scored as the sum of responses to 17 items regarding symptoms over the past month (score range 17-85).[103,104] Scores of 50 or higher are considered to indicate active PTSD.[103,104] PCL were assessed for patients before, during, and at the end of CPT/PE treatment. Average PCL scores decreased around 20 points from pre to post-treatment.[82,87,91] One article reported that the experience level of the therapist (trainee, completed training, and expert trainer) was associated with increased odds (adjusted odds ratio [AOR] 20.38 [1.03, 5.51]) of treatment response, defined as a decrease of at least 10 points and score less than 50 on PCL at the end of treatment.[77]

Additionally, 2 articles reported reductions in depression symptoms for patients treated by trainees or providers who completed CPT/PE training.[82,87] Depression was assessed using the Beck Depression Inventory-II (BDI-II), scored as the sum of 21 items addressing symptoms over a 2-week timeframe (score range 0-63).[105] BDI-II scores of 20 or higher indicate moderate to severe depression.[105] Comparing pre- to post-treatment, average BDI-II scores decreased 8-11 points.[82,87]

Adoption

Four articles reported on improved provider attitudes and self-efficacy for delivering trauma-focused therapies, as assessed by surveys pre and post-training.[78,80,87,91] For example, among 656 providers who completed PE training, there was higher expectations for positive patient outcomes from PE, and lower expectations for negative patient outcomes, when comparing pre- and post-workshop, as well as post-workshop to post-consultation survey results.[80] There was also greater average self-reported intent to use PE with patients for trainees after the consultation phase.[80]

Implementation

One article surveyed 2 groups of providers trained in CPT (n=325 and 541) regarding reasons they had not started using CPT or could not use it with more patients; the top 2 reasons were "having no or little room in their schedule" and "workload is too heavy."[87]

Maintenance

One article examined the association of provider attitudes and self-efficacy pre- and post-training with self-reported use of PE at 6 months.[78] Providers reported using PE for 14% of their patients on average, and pre-training expectations for positive and negative patient outcomes were associated with using PE for higher and lower numbers of patients, respectively.[78] Changes in provider attitudes and self-efficacy during and after training were not associated with use of PE.[78] Another article reported survey results for 566 providers, 6 and 18 months after completion of PE training; perceived effectiveness of PE on 6-month surveys predicted providers' self-reported use of PE at 18 months, assessed as proportion of their patients with PTSD being treated by PE.[76] Additionally, providers' positive perceptions at 6 months about their ability to generate referrals for PE was also predictive of self-reported use of PE at 18 months.

VHA: New Referral Process and Preparatory Group Sessions

One article reported results from a new referral process for mental health treatment for PTSD.[75] Authors first conducted stakeholder interviews to identify a range of barriers and facilitators, then developed educational materials for PCPs and a referral system involving 1 session of CBT delivered by PCMHI to referred patients. For reach, the primary care clinic using these strategies had 12% of its patients with PTSD (n=34) referred to psychotherapy, and 5% (n=13) attended at least 1 session of CPT/ PE.[75] A comparator clinic (who did not use the new processes) had 4% of its patients with PTSD referred to psychotherapy, and 1% who attended at least 1 session of CPT/PE. The authors intended to examine effectiveness (changes in PTSD symptoms and quality of life after referral), but data were available for only 9 patients who received CPT/PE.

Additionally, 1 article reported on reach and effectiveness of CPT/PE for patients who had first attended preparatory psychoeducation sessions, compared with those who had not.[73] Both groups had decreased symptoms pre- to post-treatment, and authors reported no differences in completion rates. However, providers preferentially referred patients to preparatory sessions if "they had reservations" about CPT/PE; it was unclear how authors addressed bias due to selection, which may have masked the effects of preparatory groups (*ie*, only patients who were less likely to complete treatment were first referred to preparatory groups).

Barriers and Facilitators in VHA Settings

Fourteen articles addressed persistent barriers and facilitators in VHA settings, using mainly interviews with patients, mental health providers, and clinic and facility leadership; results are summarized in Table 7. Reported results pertained to Intervention Characteristics(n=5),[61,62,65,75,102] Outer Setting (n=7),[61,62,65,67,68,70,102] Inner Setting (n=11),[56,61,62,65,67,68,70-72,75,102] and Characteristics of Individuals (n=10).[58,60,65,68-72,101,102] There were no results applicable to the Process domain.

Intervention Characteristics

Five articles provided results on several subdomains, including Intervention Source, Evidence Strength and Quality, Relative Advantage, Adaptability, and Complexity (Table 7). Mental health providers thought CPT/PE to be generally effective[61,65,102] but were concerned that they may not work for all patients.[61,65] CPT/PE were developed for non-Veterans and may not adequately address comorbidities (both physical and mental health conditions) and complex trauma history commonly seen for Veterans in VHA care.[61] One study interviewed providers from clinics that varied in the proportion of patients receiving psychotherapy who were treated with CPT/PE; providers from clinics using less CPT/PE reported that these therapies "did not live up to expectations" and "described the clinical benefits as 'partial'."[65] Providers noted as positives that CPT/PE were short-term and relevant[61] but also thought other treatments can be effective.[61,65,102] Additionally, providers noted the inflexibility of CPT/PE, the need to adapt the manualized content for certain patients,[61,65] and lack of research guiding adaptations.[65] Patients also found referral processes to be complex and burdensome.[62] PCPs noted treatment of PTSD would also benefit management of patients' physical health conditions.[75]

Outer Setting

Seven articles described results pertaining to patient factors, including Patient Needs and Resources, Knowledge and Beliefs, and Other Attributes (Table 7). Patients reported difficulty attending appointments due to competing personal commitments and medical care burden.[62,68] Some patients also had privacy concerns related to the stigma of mental health treatment.[68] Shared decision-making (with detailed explanations of treatment options), sharing stories of other patients who improved with CPT/PE, and discussing positive research on these therapies were reported to increase patient buy-in.[70] However, some patients did not recall information about CPT/PE, or only had vague recollections, despite medical records that documented discussions.[62] Providers were also concerned that patients who were used to receiving supportive therapy may not find short-term treatment or possible recovery to be credible.[65] Some sites offered preparatory psychoeducation groups to educate patients about CPT/PE and improve coping skills,[65,102] and some screened patients to identify those receptive to CPT/PE.[65] Providers noted the strong level of VHA support for CPT and PE (External Policies and Incentives), although these therapies were not perceived to fit well within broader community practices beyond VHA (General Practice Climate).[65]

Inner Setting

Eleven articles addressed subdomains including Networks and Communication, Culture, Implementation Climate, Readiness for Implementation, Provider Decision-making, and Patient-Provider Relationships.

Networks & Communication

In the previously noted study on PTSD clinics that varied in use of CPT/PE, those clinics using CPT/PE with more patients had weekly consultation groups for providers to discuss cases and other issues.[65] Some patients reported frustrations with complexity and “red tape” in VHA processes for referrals and obtaining different services for both mental and physical health conditions, leading to “overall rejection of the system.”[62]

Culture

Some providers felt pressure to use CPT/PE, reporting that “the VA culture is like it’s [CPT/PE] or nothing.”[61] Provider perceptions of organization culture were not associated with provider use of or adherence to CPT/PE protocols.[71] Some patients believed that VHA had a negative reputation, due to media reports or concerns from individuals in their social networks.[62]

Implementation Climate

In PTSD clinics using CPT/PE with more patients, staff believed that their main mission was to deliver CPT/PE (Compatibility and Relative Priority); these sites also had databases that tracked patient referrals, attendance, and outcomes, as metrics for feedback to staff and local leadership (Goals and Feedback).[65] Another article reported that mental health and primary care leaders at 1 VHA facility perceived a need to increase the number of appropriate patient referrals for PTSD treatments.[75]

Readiness for Implementation

PTSD clinics using CPT/PE with more patients had local leaders who were experienced with CPT/PE and highly engaged in implementation of these therapies.[65] These sites also had dedicated resources, including protected time for staff to attend weekly consultation meetings and databases that tracked patient referrals and outcomes.[65] Staff at all sites noted the importance of being able to control their appointment schedules, and 1 site with low use of CPT/PE had given providers more flexibility in their schedules to help increase use of CPT/PE.[65] Workload and scheduling challenges were often noted as barriers,[65,71,102] but 1 study did not find these factors to be associated with providers’ self-reported use of CPT/PE or adherence to therapy protocols.[71] In another study, providers perceived ongoing VHA support for training,[61] but other articles indicated that some clinics lacked trained staff and capacity to deliver CPT/PE.[38,71] For Access to Knowledge, mental health providers reported research results were helpful for treatment decisions, but they had variable confidence in research focusing on different types of PTSD (*eg,* PTSD with shame).[69] PCPs were noted to need more information about availability

PTSD treatments, recognizing PTSD symptoms, and scripts to help with discussing PTSD treatments with hesitant patients.[75] One article reported some patients disliked VHA facilities, which were maze-like, crowded, and perceived as unsafe.[62]

Provider Decision-making

Several articles highlighted providers' consideration of patient factors in determining if they should offer CPT/PE or other mental health treatments. In addition to patients' comorbidities, coping skill, and home situation, providers also considered patients' history of missed appointments; providers sometimes made decisions without patient input but at other times, collaboratively with patients.[67,68] Explaining treatment options and collaborative decision-making was noted as potentially helping with patient buy-in,[70] although patients who were referred but did not initiate CPT/PE were also mostly satisfied with their involvement in decision-making.[62] More providers preferred PE (vs CPT) for patients with low literacy, poor cognitive functioning, or traumatic brain injury; they preferred CPT for patients with strong guilt or shame.[69]

Patient-Provider Relationships

Among patients who were referred to CPT/PE but did not initiate treatment, some reported history of poor experiences with either providers making referrals or non-mental health clinicians; however, many of these patients also had positive experiences with mental health providers.[62]

Characteristics of Individuals

Ten articles reported results pertaining to subdomains of Knowledge and Beliefs, Self-efficacy, and Other Personal Attributes. With regard to Knowledge and Beliefs, 1 article reported that providers were slowly growing in acceptance of patients improving with short-term therapy and being able to "move on."[102] In the study described above which examined PTSD clinics that varied in use of CPT/PE, mental health providers and leaders at sites using more CPT/PE reported commitment to these therapies; they also believed that use of CPT/PE had benefits for the clinic, including better recruitment and morale among providers.[65] Other studies reported that a variety of provider characteristics had small associations with both positive and negative perceptions of PE,[72] and greater perceived effectiveness of CPT/PE was associated with higher use of CPT/PE.[71] Several articles examined role of cognitive-behavioral orientation, finding that it was associated with perceived effectiveness of PE but not with use of PE,[71] and use of CPT.[60,101] One article reported survey results of 247 mental health providers trained in CPT/PE, finding that 46% preferred PE and 13% preferred CPT; provider characteristics were not associated with preferences.[69] One article noted that PCPs may value more CPT/PE if they were more familiar with the evidence supporting their effectiveness.[75]

One study also surveyed provider self-efficacy for PE, finding small associations between provider characteristics (*eg*, experience with PTSD treatments) and self-efficacy.[72] Several other articles noted Other Personal Attributes of mental health providers including that graduate training in CBT was not associated with provider use of CPT/PE[58] or provider perceptions of patient preferences for CPT/PE.[60,101] Provider expressions of encouragement and reassuring manner were perceived by patients as helping them to move forward with CPT/PE[70] but some patients reported interruptions in treatment from providers leaving the facility (temporarily or permanently) due to a variety of reasons.[68]

Implementation in Non-VA Settings, and Barriers and Facilitators

Only 3 articles addressed CPT/PE in non-VA settings. One reported outcomes of a training program for non-VA community mental health providers; this used a combination of in-person workshops and external expert consultation that was similar to VHA programs.[74] Adoption was assessed using surveys of 134 providers at 6 months post-workshop; trainees who were taking part in the consultation (rather than only completing workshops) had higher odds of self-reported use of CPT/PE (OR 11.37 [3.2, 40.3]).[74]

Two articles addressed barriers and facilitators among community providers; 1 surveyed 463 mental health providers in Texas, who reported low overall barriers for using CPT/PE.[63] For example, most (66%) perceived ability to be reimbursed for treating PTSD (Outer Setting—External Policies & Incentives), and most (64-70%) felt that treatments fit well within their existing practice (Inner Setting—Implementation Climate, Compatibility). However, few providers were trained CPT/PE (<25%). The other article reported results from an online survey of 352 mental health providers in New England.[66] Although 70% were comfortable treating Veterans, only 40% were familiar with CPT/PE and 34% had received training (Characteristics of Individuals—Knowledge and Beliefs, Other Attributes). Barriers to training included needing to take time from work and the cost of trainings (Inner Setting—Readiness for Implementation, Available Resources).

Table 6. Outcomes for Implementation of Trauma-Focused Psychotherapies for PTSD (CPT/ PE)—Results by RE-AIM Categories

	VHA National CPT/PE Initiatives: Training/Education, Facilitation, & Audit/Feedback (7 articles)[76-78,80,82,87,91]	VHA Preparatory Groups & New Referral Process: Increasing Patient Uptake & Adherence (2 articles)[73,75]	Non-VA Strategies: Training/Education, Facilitation, & Audit/Feedback (1 article)[74]
Reach	• Provider characteristics (*eg*, psychologist or social worker) were not associated with treatment completion by patients[82]	• No differences in completion of CPT/PE between patients who had preparatory groups vs those who did not (63% vs 69%), but referral to preparatory groups indicated not being ready for PE or CPT[73] • Higher referrals to psychotherapy (12% vs 4%) and more attended ≥ 1 session of CPT/PE (5% vs 0.8%) for PTSD patients in primary care clinic implementing new referral processes, compared with a clinic not using new process[75]	
Effectiveness	• ↓ PTSD symptoms (↓PCL 14.1-18.9) for patients treated by trainees or providers who completed training[82,87,91] • ↓ depression symptoms (↓ BDI-II 8.3-11.2) for treated patients[82,87] • Greater provider PE experience predicted higher odds of improvement (OR 2.38 [1.03, 5.51]) in PTSD symptoms[77]	• Smaller reductions in PTSD (↓ PCL 5 vs 12) and depression symptoms (↓ PHQ-9 1.4 vs 3.2) for patients who had preparatory groups vs those who did not[73] • No significant changes in PTSD symptoms or quality of life over 3 months for PTSD patients in primary care clinic using new referral processes, but very few received any treatment[75]	
Adoption	• ↑ provider confidence and self-efficacy for CPT/PE after training[78,80,87,91] • ↓ concerns about PE (*eg*, therapy distressing patients) decreased after training; beliefs about PE were associated with self-reported intent to use PE[80]		• ↑ provider confidence and self-efficacy for CPT/PE after training; 3 months after training, 58% reported using CPT/PE (85% among subset who completed consultation and workshops); 6 months after training, 64% were using CPT/PE (93% among those

	VHA National CPT/PE Initiatives: Training/Education, Facilitation, & Audit/Feedback (7 articles)[76-78,80,82,87,91]	VHA Preparatory Groups & New Referral Process: Increasing Patient Uptake & Adherence (2 articles)[73,75]	Non-VA Strategies: Training/Education, Facilitation, & Audit/Feedback (1 article)[74]
			completed consultation and workshop) [74]
Implementation	• 71-89% of providers who completed CPT training would like to use CPT with more patients; top reasons for not using CPT were heavy workload, and having no or little room in schedules[87]		
Maintenance	• 6 months after training, 77% of providers used PE with ≥ 1 PTSD patient, mean 2.3 patients treated per provider, factors significantly associated with higher numbers of patient receiving PE from that provider[78]: – working in a PTSD clinic – having more PTSD patients and larger caseloads before training – positive beliefs pre-training – increased self-efficacy during training • 71% of providers who completed PE training 18 months prior were using PE, mean 1.93 patients treated per provider; working in PTSD clinic, being male, and some positive provider beliefs about PE (at 6 months) were associated with more patients being treated per provider[76]		

Abbreviations: BDI-II=Beck Depression Inventory; CPT=cognitive processing therapy; OR=odds ratio; PCL=PTSD Checklist; PE=prolonged exposure therapy; PTSD=posttraumatic stress disorder; VA=Veterans Affairs; VHA=Veterans Health Administration

Table 7. Barriers and Facilitators for Uptake of Trauma-Focused Psychotherapies for PTSD (CPT and PE)—Results by CFIR Domains

	VHA (12 articles)[58,60-62,65,67-71,101,102]	Non-VA Community Settings (2 articles)[63,66]
I. Intervention Characteristics	**Intervention Source** • CPT/PE developed and tested in civilians, Veterans are more complex with greater comorbidities[61] **Evidence Strength & Quality** • Generally effective,[61,65,102] but not for all patients[61,65] **Relative Advantage** • Other mental health treatments can be effective[61,65,102] • In PTSD clinics using CPT/PE with more patients, providers perceived other treatments as less effective[65] • PCPs noted treating PTSD would also help with physical health conditions[75] **Adaptability** • Lack of flexibility in protocol, providers felt need to adapt some parts or duration[61,65] • More research needed to guide adaptation, lack of adaptability contributes to patient drop-out[65] **Complexity** • CPT/PE are short-term and relevant,[61] but referral processes are complex and burdensome for patients[62]	
II. Outer Setting	**Patient Needs & Resources** • Barriers to attendance—work or school, transportation, physical health, caretaking responsibilities, anticipated redeployment[62,68] **External Policies & Incentives** • Providers perceived strong VHA support for CPT/PE and importance of VA's commitment to training[65]	**External Policies & Incentives** • 66% of mental health providers in Texas reported ability to be reimbursed for PTSD care[63]

	VHA (12 articles)[58,60-62,65,67-71,101,102]	Non-VA Community Settings (2 articles)[63,66]
	Patient Knowledge & Beliefs about Intervention • Detailed orientation to treatment before beginning CPT/PE, sharing of providers' successes with other patients, and information on positive research outcomes all increased patient buy-in[70] • Patients often did not remember CPT/PE being discussed during referral processes or only recalled vaguely, and some did not buy in to treatment rationale[62] • Some had privacy concerns about who would know about treatment[68] • Clinic directors and providers noted that preparatory groups help inform patients about CPT/PE and improve coping skills[65,102] • PTSD clinics using CPT/PE with more patients tended to have preparatory groups and screening procedures[65] • Providers noted that some patients had received supportive psychotherapy for a long time, they (and their therapists) may not find short-term treatments or potential recovery to be credible[65] **Other Patient Attributes** • Provider concerns that CPT/PE does not work for all patients, many Veterans are complex with more comorbidities[61,67,68] and some may not have skills or be in safe situation for CPT/PE[67,68] **General Practice Climate & Patterns** • Providers perceived that CPT/PE did not fit with "emphasis on psychodynamic psychotherapies within the larger community"[65]	
III. Inner Setting	**Networks & Communication** • PTSD clinics using CPT/PE with more patients had peer consultation groups that staff attended weekly[65] • Patients frustrated by complexity and bureaucratic "*red tape*" of VHA care, leading to "*overall rejection of the system*"[62]	**Implementation Climate:** • **Compatibility** – Most surveyed providers (in Texas) reported PTSD treatments fit well with their work (64%), and would be easy to

Culture

- Some providers felt pressure to use CPT/PE: *"It is pretty much all we offer…the VA culture is like it's* [CPT/PE] *or nothing*"[61]
- Perceptions of organizational politics and fair treatment were not associated with provider use or adherence to CPT/PE[71]
- Some patients perceived that VHA had negative reputation, due to media stories or concerns within their social circle[62]

Implementation Climate:

- **Tension for Change**
  - Mental health and primary care leadership perceived need to increase appropriate referrals for PTSD treatment[75]
- **Compatibility; Relative Priority**
  - In PTSD clinics using CPT/PE with more patients, staff perceived that their *"primary mission* [was] *to deliver PE and CPT… 'It's always been made clear the kind of program this is…If that does not fit with your orientation, that's OK but we're not going to change, that's what you are going to be doing if you come in here…' "* [65]
- **Goals & Feedback**
  - PTSD clinics using CPT/PE with more patients often had databases tracking patient referrals, attendance, and outcomes[65]

Readiness for Implementation:

- **Leadership Engagement**
  - Leaders of PTSD clinics using CPT/PE with more patients were experienced with CPT/PE and engaged in implementation[65]
- **Available Resources**
  - PTSD clinics using CPT/PE with more patients had resources including databases to track patient outcomes, protected time for staff to participate in weekly consultation meetings[65]

incorporate (70%); few thought it would be complicated to use (18%)[63]

Readiness for Implementation:

- **Available Resources**
  - Most surveyed providers (in New England) were interested in training (87%), but noted barriers including needing to take time away from work (56%) and high training costs (52%)[66]

	VHA (12 articles)[58,60-62,65,67-71,101,102]	Non-VA Community Settings (2 articles)[63,66]
	– Providers noted importance of controlling their own appointment schedules[65] – Providers often reported workload and scheduling challenges[65,71,102] but these factors were not associated with use or adherence to CPT/PE[71] – Providers perceived VHA support for ongoing training and resources[61] – Not enough trained staff or capacity to deliver CPT/PE[68,71] – Some patient concerns with VHA buildings being "*like a maze*" and crowded, feeling unsafe especially for those with PTSD[62] • **Access to Knowledge & Information** – Providers reported research was helpful for treatment decisions, with variable confidence in research focusing on specific types of PTSD (*eg*, PTSD with disgust vs with shame)[69] – PCPs need more information on availability of PTSD treatment services, help with recognizing PTSD symptoms, and scripts to help with talking to hesitant patients[75] **Provider Decision-making** • Provider concerns that some patients may not have skills or be in safe situation for CPT/PE[67,68] • Providers used clinical judgments to decide whether to offer CPT/PE for certain patients, not necessarily discussing some considerations with patients (*eg*, missed appointments in the past) but also reaching joint decisions with patients in other circumstances (*eg*, home safety situation)[67] • Providing and explaining treatment options may increase patient buy-in[70] • Patients who did not initiate CPT/PE were mostly satisfied with their involvement in deciding between treatment options[62] • Providers preferred PE (vs CPT) for patients with low literacy, cognitive impairment, or TBI; but preferred CPT (vs PE) for	

	VHA (12 articles)[58,60-62,65,67-71,101,102]	Non-VA Community Settings (2 articles)[63,66]
	those with strong guilt or shame; most valued patient preferences[69] **Patient-Provider Relationships** • Some patients who did not initiate CPT/PE reported poor experiences with providers making referrals or others in non-mental health contexts, but many also reported positive experiences with mental health providers[62]	
IV. Characteristics of Individuals	**(Provider) Knowledge & Beliefs about Intervention** • Providers slowly “leaning more toward the idea” that patients can “move on” and not need long-term therapy[102] • In PTSD clinics using CPT/PE with more patients, providers and leaders were committed to these therapies and believed their use helped with recruitment of providers and boosting morale[65] • Variety of provider characteristics had small associations with positive and negative perceptions of PE[72] • Greater perceived effectiveness was associated with higher adherence to CPT/PE manuals and use of CPT/PE[71] • Providers with cognitive-behavioral orientation: – More likely to perceive PE as effective but no associations with use of PE or adherence to manuals[71] – More likely to use CPT and report patients prefer CPT[60,101] • Among providers trained in CPT/PE, 46% preferred PE, 13% preferred CPT and 41% had no preference; provider characteristics were not associated with preference for CPT or PE[69] • PCPs may value CPT/PE more if they knew evidence base for these[75] **(Provider) Self-efficacy** • Provider characteristics having small associations with self-efficacy for PE: having more experience treating PTSD and working in specialty PTSD (vs general mental health) clinic[72]	**(Provider) Knowledge & Beliefs about Intervention** • Among surveyed mental health providers (in Texas), psychologists were more aware of treatment guidelines for PTSD (61% vs 37% of masters-level providers), but few knew about VHA guidelines (25% of psychologists, 12% masters-level providers)[63] **(Provider) Self-efficacy** • Among surveyed mental health providers (in Texas), more psychologists were confident with PTSD assessments (65% vs 48% of masters-level providers); confidence with CPT/PE associated with self-reported use (OR 5.7-9.1)[63] **(Provider) Other Personal Attributes** • Few mental health providers were trained in CPT (23-28%) or PE (8-16%) [63,66]; prior training associated with use of CPT/PE (OR 23-34)[63]

VHA (12 articles)[58,60-62,65,67-71,101,102]	Non-VA Community Settings (2 articles)[63,66]
(Provider) Other Personal Attributes • Graduate school training in CBT not associated with provider use of CPT/PE[58] or perceived patient preferences for CPT/PE[60,101] • Some providers gave gentle encouragement and expressed confidence in patients, empowering them to try CPT/PE[70] • Treatment interruptions occurred due to providers leaving for various reasons[68]	

Abbreviations. CPT=Cognitive processing therapy; OR=odds ratio; PCP=primary care provider; PE=prolonged exposure therapy; PTSD=posttraumatic stress disorder; VA=Veterans Affairs; VHA =Veterans Health Administration

CBSST, DBT, MET, AND CONTINGENCY MANAGEMENT (KQ 2)

Key Results

- Barriers for CBSST included
    - understaffed/overworked teams, additional administrative demands needed to deliver treatment, negative impact on provider productivity requirements
    - perceived burden of delivering treatment
- Facilitators for CBSST included
    - government/regulator rules, guidelines, and resources that could be used to support implementation
    - leadership engagement
    - training support and monitoring, and resources including training materials and tools
    - networks/communication among providers to track progress
    - provider positive beliefs, openness to try new things, confidence delivering treatment
    - direct or indirect experience with positive outcomes attributed to CBSST
- MET knowledge and skills increased during VHA national training, with 53% of therapists using MET routinely after training.
- Over two-thirds of clinics integrated the standard course of CM in outpatient SUD treatment setting, with most operational over 40 months post-training.
- Leadership engagement and provision of resources facilitated implementation of DBT in VHA, but providers had difficulty completing online training during working hours.

Section Overview

One article addressed barriers and facilitators for CBSST in US community treatment teams.[99] A total of 87 participants from 6 different stakeholder groups participated in 14 focus groups: 2 client groups (n = 8), 6 team service provider groups (n = 54), 3 team supervisor groups (n = 11), 1 agency administrator group (n = 5), 1 public sector administrator group (n = 5), and 1 group for CBSST developers/trainers (n = 4).

Four other articles examined implementation outcomes following training for DBT, MET, and CM in VHA.[79,95,96,100] Two focused on VHA national initiatives to implement MET[79] and CM.[100] The VHA MET training included 264 mental health providers who participated in a 3.5-day training workshop followed by 6 months of consultation with a training consultant, including review of audiotapes, during 2012-2013.[79] We classified this implementation strategy as training/education, facilitation, and audit/feedback.

The VHA CM training consisted of 4 separate trainings (each 1.5 days) during April-July 2011[100] Following training, clinicians participated in at least 2 conference calls during which implementation issues were further discussed. The article evaluated implementation outcomes 55 months after the start of training at 94 VHA sites. We classified the implementation strategies in this study as training/education and facilitation.

Additionally, 1 article reported outcomes following web-based DBT training of 44 mental health providers at 10 VHA medical centers.[96] Following training, providers met monthly with 1 of 2 DBT facilitators over 9 months to discuss use of engagement and facilitation techniques. We classified the implementation strategies in this study as training/education and facilitation.

The other article was a VHA national program evaluation of DBT implementation at 59 sites, including interviews with clinical providers and administrators involved in DBT implementation at 8 high- and 8 low-performing sites.[95] The authors indicated that DBT is not nationally implemented and disseminated by VHA, but a community of practice has been created as a way to connect providers and share resources. We classified this implementation strategy as learning collaborative.

Below, we first summarize results for the article addressing barriers and facilitators to uptake of CBSST, and then describe remaining studies on implementation outcomes for MET, CM, and DBT. Detailed characteristics and results for these articles are found in Appendix Table G2 and Appendix Table G3.

Barriers and Facilitators for CBSST

Intervention Characteristics

This article addressed Adaptability and Complexity as barriers or facilitators to implementation of CBSST, including the provider's ability to apply the treatment flexibly "on the fly" during regular visits, and having enough time during scheduled visits to go as "deep" as needed for the treatment.[99]

Outer Setting

External Policy and Incentives was a facilitator for implementation of CBSST, including government/regulator factors such as external rules, guidelines, and resources that could be used to support implementation, including funding, data systems, and official recognition of treatment as an effective approach.[99] This article also identified Other Patient Attributes impacting implementation, including relevance of CBSST concepts/ideas to clients, openness of clients to structured material (*eg*, workbooks, homework) and client motivation/buy-in to do CBSST.[99]

Inner Setting

For Readiness for Implementation, the article reported Available Resources was a barrier or facilitator to implementation of CBSST, including understaffed/overworked teams, additional administrative demands needed to deliver treatment, impact on provider productivity requirements, initial and ongoing training support and monitoring of the implementation (*ie*, time allotted for training/supervision), and training resources such as materials and tools to support implementation. Leadership Engagement was important to implementation, including leadership buy-in of and support for treatment, prioritization of treatment by leadership and communication about importance of treatment from supervisors and leads.

This article addressed Implementation Climate, identifying Compatibility as important to implementation, including the extent to which CBSST complements and improves treatment process and structure and can be successfully implemented within the treatment program.[99] This study also identified Networks and Communication as an important implementation factor, including effectiveness of systems/processes to communicate client CBSST information among existing providers, making sure providers have tools to track/monitor client progress, and seeing other providers succeed in delivery CBSST.[99]

Characteristics of Individuals

The article identified Knowledge and Beliefs about the Intervention as important to uptake,[99] including provider beliefs about whether CBSST improves client outcomes (*eg*, level of provider "buy-in" or enthusiasm for treatment), provider perception of usefulness/relevance of CBSST skills to other interventions, perceived burden of delivering CBSST, and direct or indirect experience with positive outcomes attributed to CBSST (*eg*, receiving positive feedback from clients about CBSST).[99] This study also identified Self-efficacy, including provider confidence in delivering CBSST, and Other Personal Attributes, including provider openness to try new things.

Implementation of MET, CM, and DBT

Four articles evaluated various VHA implementation efforts for these EBPs, using survey data from trainees and those who completed training, and information about patients treated by providers and clinics implementing these EBPs. Reported outcomes addressed Reach, Effectiveness, Adoption, Implementation, and Maintenance.[79,95,96,100]

The article evaluating pre-post outcomes following VHA national training initiative for MET; of 264 therapists, 80.7% (n = 213) successfully completed all training requirements.[79] Regarding adoption outcomes, MET-specific knowledge increased significantly from pre-training to post-workshop and post-consultation, and 53% of therapists reported using MET routinely.[79]

The article evaluating implementation outcomes for CM reported reach outcomes, stating that 94 VHA SUD programs made CM available to 2060 patients, an average of 22 patients per site over the study period of 55 months.[100] The 94 participating programs extended throughout the US, from White River Junction, Vermont to Seattle, Washington. Three-quarters of the sites (70 of 94) participated in at least 5 coaching calls over 12 months after beginning delivery of the treatment. In terms of effectiveness, of the 27,850 submitted urine samples, 91.9% (n = 25,593) tested negative for the targeted substance(s). For adoption, 94 VHA SUD treatment programs adopted CM from June 6, 2011 (when the first of the 94 programs began delivering CM) to December 31, 2015. For implementation, over two-thirds of clinics integrated the standard course of CM (12 weeks of twice-weekly sessions targeting stimulants with an 8-draw cap) in an outpatient SUD treatment setting. For 4 indices of CM implementation fidelity, 96% of programs related prizes to abstinence, 81% asked about desired prizes, 67% distributed reminder slips, and

54% had test results immediately available. For maintenance outcomes, the majority of CM programs were operational for over 40 months post-training.

One article evaluated pre-post outcomes following online training and external facilitation of DBT skills for 44 providers at 10 VHA medical centers; of 44 participating providers, 93% (n = 41) completed training and 74% attended every facilitation call.[96] For adoption, 6 weeks post-training, 22 of 26 respondents completing an evaluation reported conducting a DBT skills group. For implementation, many providers (73%) had difficulty completing online training during working hours. Total personnel hours for the DBT skills training (for facilitation experts, facilitators, and participants) were 1,298. The 2 facilitators spent 90 hours in support of the training, and participants spent roughly 1,189 total personnel hours in the training (average = 29 hours each). Additional non-personnel costs totaled $17,894, which included $16,928 for access to the web-based modules for 46 people (44 participants and 2 facilitators) and $966 for copies of the Skills Training book. For maintenance, at 5-month follow-up, 54% (n = 22) of participants reported conducting a DBT group.

The article reporting a VHA national program evaluation of DBT implementation reported barriers and facilitators to implementing DBT, stating that “logistical, structural, and local policy changes facilitated implementation.” These changes were related to leadership engagement and provision of resources.[95] For example, clinicians were given job flexibility and time to get DBT programs up and running. Sites created DBT programs that cut across clinics and modified VHA policy to allow clinicians to call patients outside of business hours.

SUMMARY AND DISCUSSION

SUMMARY OF KEY FINDINGS

In this systematic review, we sought evidence relevant to implementation of EBPs for chronic pain and chronic mental health conditions, focusing on 1) barriers and facilitators at the patient, provider, and system levels; and 2) results of various implementation strategies aimed at promoting uptake of and engagement with EBPs. We identified 67 eligible articles, with most of these addressing CBT or CPT/PE. Additionally, the vast majority of studies were conducted in VHA, with the exception of those for MBSR and ACT, which occurred in non-VA US community settings or non-US countries, respectively. Key findings include:

- Evidence on CBT for chronic pain mostly addressed individual therapy (via telehealth or in person), while MBSR and ACT occurred in group settings in person.
- Barriers to CBT for chronic pain included cultural, communication, and logistical barriers; mismatch between patient knowledge and beliefs about pain and EBP principles; logistical conflicts for patients; and patient attributes including high pain-related interference.
- Facilitators of CBT for chronic pain included positive patient-therapist dynamics; good match between patient knowledge and beliefs about pain and EBP principles; patient readiness for change; and telehealth availability.
- One article showed that CBT and MBSR for chronic pain were cost-effective for improving quality of life.
- Barriers to MBSR and ACT for chronic pain included mismatch between patient knowledge and beliefs about pain and EBP principles; the physical discomfort of being seated for sessions; and logistical conflicts.
- Facilitators of MBSR and ACT for chronic pain settings included positive group dynamics and good match between patient knowledge and beliefs about pain and EBP principles.
- Barriers of CBT for chronic mental health conditions included lack of resources and referring provider knowledge about CBT, and patient factors (*eg*, comorbidities, cultural and communication barriers, transportation barriers).
- Facilitators of CBT for chronic mental health conditions included: scalability and convenience of CBT tools and resources; local champions and leadership support; and strong networks and communication across clinics and teams.
- Barriers to CPT/PE in VHA settings included inflexibility of treatment protocols, complex referral processes, patient complexity and competing needs, and negative perceptions of VHA care.

- Facilitators of CPT/PE in VHA settings included strong support for training, perceived effectiveness for patients and benefits for clinics, and positive patient experiences and relationships with providers.

- In non-VA community settings, mental health providers generally had low concern for barriers, but few had been trained in CPT/PE.

- Barriers for CBSST included workload and staffing challenges. Facilitators were supportive external policies and resources, leadership engagement, training support and materials, networks and communications among providers, and positive provider perceptions and experience.

- Facilitators for DBT included leadership engagement and training resources, but providers had difficulty completing online training during working hours.

- National or local VHA training initiatives for CBT, ACT, and CPT/PE involved training/education, facilitation, and audit/feedback.

- Large numbers of mental health providers have completed VHA national training programs for EBPs, leading to improved provider perceptions, self-efficacy, and providers skills for delivering EBPs, but persistent barriers limit reach and adoption.

- VHA implementation of CBT for chronic pain and chronic mental health conditions, ACT for depression, and CPT/PE reduced symptoms and improved quality of life for patients.

- Over two-thirds of VHA SUD treatment clinics (that participated in national VHA initiative) implemented standard CM, with most operational 40 months post-training.

- Non-VA providers who underwent a training program for CPT/PE reported higher self-efficacy post-training, and use of CPT/PE at 3 (58%) and 6 months (64%).

Results regarding barriers and facilitators to uptake of CBT, MBSR, and ACT for chronic pain mainly addressed patient-level factors. We classified these as pertaining to the CFIR domain of Outer Setting, including common subdomains Patient Needs and Resources and Patient Knowledge and Beliefs. A commonly perceived barrier to uptake of all 3 EBPs was mismatch between patients' pain beliefs and experiences and patients' perceptions of core EBP concepts, while a good match was a facilitator. Logistical barriers were common for patients within all 3 EBPs, and telehealth overcame some of these barriers within tCBT. High pain-related interference was associated with poor adherence to some CBT and MBSR interventions. Patient demographics did not consistently predict adherence to CBT, MBSR, or ACT; however, 1 study developing group CBT for a rural, low-literacy population with chronic pain found that lower educational attainment was associated with both declining to participate and not completing the intervention. Only 2 articles addressed barriers and facilitators at the provider or system level: 1 cost-effectiveness analysis of MBSR and CBT versus UC and 1 analysis of GP interviews about chronic pain treatments including CBT. Definitions of chronic pain and inclusion/exclusion criteria varied across studies.

Evidence on barriers and facilitators for EBPs for chronic mental health conditions addressed patient, provider, and system factors, and pertained to a variety of CFIR domains. Shared barriers across these EBPs included workload and scheduling challenges for providers, lack of educational resources and training for referring providers, transportation needs and competing responsibilities for patients, and variable patient buy-in to treatment rationale. Shared facilitators were leadership engagement, training and treatment delivery resources, communications and networks for continuing provider education, and positive patient-provider relationships. It is important to note that these psychotherapy approaches are distinct from those employed for chronic pain management and focus on independent non-pain conditions. For example, CPT/PE focuses on trauma processing and CBT-I focuses on regularizing the sleep-wake cycle. Although it is likely that some barriers and facilitators generalize to chronic pain treatments, especially at provider and system levels, therapies for non-pain conditions may have unique challenges to implementation relative to EBPs for chronic pain.

VHA national training programs for a variety of EBPs increased provider self-efficacy and improved perceptions of EBP, particularly after completion of expert consultation, suggesting that there is additional benefit to audit and feedback. However, it is unclear the degree to which these initiatives increased uptake by appropriate patients and overall adoption by providers. It is also unclear whether external facilitation has added benefits. National VHA training initiatives provided centralized facilitation resources, including salary support for clinicians; patient-facing EBP materials and tools; and coordination and organizational support for training and problem-solving. It is unclear to what degree these resources enhanced adoption in addition to training and audit/feedback. Only 1 small study examined external facilitation independently of training, finding no added benefit for facilitated participants in terms of specific CBT knowledge and skills at 3 months post-workshop.

In general, VHA training programs for a variety of EBPs led to sustained effects on provider use of EBPs but with persistent concerns about level of uptake by patients who would benefit from these treatments. Across EBPs, there was variable contribution of patient barriers to reach (*eg*, lack of acceptability for patients) and provider barriers to adoption (*eg*, workload and scheduling challenges) that resulted in lower numbers of patients receiving EBPs. In some cases, there were likely interactions between patient and provider factors, where lower patient acceptability may have contributed to provider concerns regarding appropriateness or prioritization of certain EBPs. In other cases, lower levels of uptake may primarily have been due to lack of capacity for treatment delivery (*eg*, competing work demands for providers).

These results indicate that VHA national initiatives for EBPs have largely not focused on patient barriers and facilitators for uptake, or addressed potential heterogeneity in treatment response due to patient factors. A notable exception may be the interactive decision aid for PTSD (developed by the VA National Center for PTSD) that provides tailored treatment information and recommendations according to patient preferences and values.[106] Additionally, there may be important tradeoffs to consider for options that address transportation barriers and competing responsibilities during the workday. For example, EBPs may be delivered via telephone or videoconferencing, to address transportation and time barriers, but this may negatively impact development of therapeutic alliance due to lack of in-person contact. Moreover, our results show that different patients may have strong and opposing preferences for formats (*eg*, telephone vs in-person sessions) or communication styles (*eg*, group facilitators maintaining structured control vs letting participants tell their own stories at length), which may be difficult for mental health clinics and providers to accommodate. It also remains unclear how options in EBP format or tailoring may improve treatment uptake and response.

Finally, our results showed variation in the formats and duration of certain EBPs. These differences likely reflect consideration of resources (space and provider capacity) and patient needs (extending sessions to account for patient progress). Such variability present substantial challenges in distinguishing the "core" of essential treatment characteristics from the "adaptable periphery" of elements that may be modified without threatening efficacy. Additionally, some implementation strategies aimed at increasing patient readiness for EBPs (*eg*, patient preparatory groups) may constitute distinctive treatments that warrant high-quality studies examining efficacy along with implementation outcomes. However, our results also suggest that efforts to clearly define EBP content and duration may lead to greater provider barriers to adoption of EBPs, due to higher perceived inflexibility and lack of adaptability.

IMPLICATIONS FOR VA POLICY

VHA has made substantial investments in providing high-quality EBPs and remains committed to improving access to mental health services for Veterans. Our results indicate that VHA national training programs for EBPs have greatly increased the number of mental health providers who are prepared to deliver EBPs. However, our results on persistent barriers to uptake suggest that VHA national initiatives for EBPs should focus on additional avenues to further increase the reach of these therapies. First, there may be value in coordinated efforts to address patient-level barriers to uptake. While VHA has developed patient-facing EBP educational materials, these may not adequately address patient concerns; for the most part, these materials generally describe treatments for various conditions and are not otherwise tailored to patient needs or goals.[107,108] To be successful, informational materials may need to be tailored to address specific concerns and optimized for dissemination to particular groups. Thus, development and dissemination of improved patient-facing resources may help increase patient awareness and buy-in.

Additionally, national VHA programs may consider guidance or support for delivery formats or options beyond in-person meetings during the workday. During the COVID-19 pandemic, there were rapid shifts to EBPs delivered via telehealth,[109] including for VHA mental health services. VHA has started to evaluate the current experience with EBP via telehealth, as compared with in-person treatment (VHA mental health leadership, personal communication, 2021). Hopefully, these evaluations will deepen our understanding of the impacts and trade-offs between different delivery formats, thereby helping to inform best practices that can be disseminated across VHA facilities.

It may also be important for VHA initiatives to provide additional support and information for facilities regarding how to organize and integrate mental health services. For example, how should local leadership evaluate their capacity for delivering various EBPs and balance competing demands and priorities between EBPs? There may also be opportunities to improve efficiency and enhance uptake by integrating mental health services with primary care or other specialty care services. Efforts to simplify referral pathways and streamline treatments for mental and physical health may simultaneously reduce barriers for referring providers and address patient reticence. For example, we identified 1 article reporting the development of new referral processes within primary care to streamline next steps for patients and providers and increase patients' positive attitudes towards EBPs for PTSD. Modified, brief therapy protocols for providing treatment in primary care for anxiety and depression, PTSD, and insomnia, have shown promise, although additional work is needed to establish efficacy.[86,110-112] Given the potential diversity in local resources, needs, and priorities, national VHA initiatives may consider providing guidance on performing local needs assessments and matching strategies or resources to those results (*eg*, strategies to enhance leadership engagement, train local champions, and facilitate communication across primary care and specialty clinics).

Therefore, we suggest the following:

- Develop and disseminate tailored patient-facing resources to increase awareness and buy-in.
- Evaluate outcomes for alternative EBP delivery formats (individual vs group therapy, brief vs longer treatment duration), and when appropriate, support increased options for session formats.
- Evaluate outcomes for telehealth versus in person EBP delivery, and where appropriate, support increased options for both formats and scheduling flexibility.
- Evaluate and support strategies for streamlining EBP referral processes.
- Provide guidance on local needs assessment for implementation readiness and matching of strategies and resources.

RESEARCH GAPS/FUTURE RESEARCH

There was very limited evidence on provider- and system-level barriers and facilitators for EBPs for chronic pain. Because we anticipated this potential gap, we undertook a broader review that examined evidence for provider and system factors for EBPs for chronic mental health conditions. However, there are likely some factors that are unique to EBPs for chronic pain, including provider views about effectiveness or acceptability of EBPs, availability of resources, and interactions with other VHA initiatives (*eg*, regarding opioid safety). These factors may contribute to provider referral patterns that are distinct from EBPs for chronic mental health conditions. We recommend further study of provider- and system-level barriers and facilitators to EBP for chronic pain. Additionally, most analyses of patient-level barriers and facilitators for EBPs for chronic pain, particularly for ACT and CBT, were conducted within effectiveness RCTs rather than in non-research clinical contexts. As barriers and facilitators to adherence likely vary meaningfully between clinical trials and clinical practice, we recommend further study of barriers and facilitators to EBPs for chronic pain within clinical practice settings.

Results related to EBPs for chronic pain suggest there may be substantial heterogeneity in relationships of patient-level factors to treatment uptake. Some of these, such as patient beliefs about therapy and about pain, may also be related to treatment effects, and we lack evidence on how EBPs may be tailored to patient-level factors to improve both uptake and outcomes. Heterogeneity in relationships of patient-level factors to treatment effects is also evident within EBPs for chronic pain and is becoming a methodological focus of future pain treatment research and of behavioral health research in general.[113-119] More systematic assessment of heterogeneity of treatment effects as well as of treatment uptake may identify specific patient-level targets suitable for future implementation or hybrid effectiveness-implementation work. More research is also needed to identify and clarify cultural and social factors that may mitigate both effectiveness and patient adherence for EBPs for chronic pain, in order to inform culturally and socially relevant adaptations where needed. While quantitative analyses using electronic medical record data on patient "race" and "ethnicity" did not identify barriers to adherence, these indicators are of unclear quality and are poor proxies for patient cultural and social experience. Similarly, while quantitative analyses including either "sex" or "gender" did not identify barriers to adherence, clear variable definitions were not provided, so it is unclear whether "sex" or "gender" would accurately apply: an important distinction that affects interpretation of results.[120-122] No studies explored roles of culture, race, sex, gender, or social factors in patients' views or experiences of EBPs.

The vast majority of results on implementation efforts for EBPs were from VHA national training programs. These included education/training, audit/feedback, and external facilitation. While some results indicated that audit/feedback may be important for improving provider perceptions and skills, there was a lack of evidence evaluating the impact of external feedback. This may be especially crucial to understand for healthcare systems that have fewer resources than VHA and thus lack capacity for external facilitation on the same scale as VHA initiatives. Additionally, evaluations of VHA national training programs generally did not address reach (*ie*, the proportion and representativeness of patients who initiated or completed EBPs). Although reach may be challenging to measure, even for large integrated systems such as VHA, it is nevertheless critical to assess how many (and which) patients benefit from treatments. The ultimate metric for evaluating success of any implementation strategy must be whether it increased the reach of effective treatments, leading to better outcomes for more individuals. Particularly for chronic pain treatments, evaluation of reach across a variety of clinical settings should occur in conjunction with further research into provider- and system-level factors that contribute to differences in referral rates and treatment engagement.

Few studies utilized comprehensive theoretical frameworks for assessing barriers/facilitators, examining process of change in implementation trials, and reporting outcomes. Future implementation work should be guided by theoretical domains linking barriers to strategies, examining processes of change, and comprehensively evaluating outcomes in key domains. The new CFIR subdomains that arose from this work, including Patient Knowledge and Beliefs, Other Patient Attributes, Group Dynamics, and Patient-Therapist Dynamics, may be helpful in future efforts to examine patient-level barriers to engagement with EBPs.

No studies analyzed barriers, facilitators, or implementation strategies for group CBT for chronic pain, individual ACT for chronic pain, or individual MBSR for chronic pain. While MBSR was developed in a group format for chronic pain as well as for other mental health conditions,[123,124] both CBT and ACT are provided regularly in both group and individual formats. Future research should analyze both efficacy and implementation for group CBT formats and individual ACT formats as treatments for chronic pain.

Finally, future research is needed to evaluate asynchronous digital and brief formats as possible avenues to increase reach of EBPs by addressing patient-level barriers (*eg*, transportation, time, and geographical distance). Ongoing work shows promise in establishing the efficacy and effectiveness of asynchronous digital formats for delivering EBP. Although these digital interventions may eliminate some barriers, it is currently unclear if they can consistently achieve the same benefits in symptom reduction and quality of life as traditional synchronous EBPs.[41,125-128] Furthermore, examination of implementation outcomes will also be needed to identify potentially unique barriers for these interventions. Similarly, brief formats for EBPs are another promising strategy for enhancing reach and reducing patient and provider barriers. In the case of CBT-I, initial work has demonstrated effectiveness of a brief format, while ongoing studies are exploring the effects on reach, adoption, implementation, and maintenance.[112,129-132]

Therefore, we recommend the following for future research:

- Examine provider- and system-level barriers and facilitators for CBT, MBSR, and ACT for chronic pain using comprehensive frameworks and in clinical practice settings.
- Evaluate patient-level factors contributing to heterogeneity of treatment effects and treatment uptake for EBPs for chronic pain and identify targets for future effectiveness and implementation work.
- Evaluate patient-level sociocultural and demographic factors including sex, gender, race and ethnicity accurately and with clear analytic purpose, recognizing the importance of clear definitions consistent with data analyzed and the roles of demographic indicators as limited proxies for sociocultural experience.
- Evaluate the added value of external facilitation when used with education/training and audit/feedback.
- Describe reach for EBPs associated with implementation strategies, such as VHA national training programs for EBPs.
- Use implementation frameworks to guide future evaluations of barriers and facilitators, processes of change, and outcomes in key domains.
- Evaluate efficacy and implementation outcomes for group CBT formats and individual ACT formats as treatments for chronic pain.
- Evaluate efficacy and implementation outcomes for asynchronous digital and brief formats for various EBPs.

LIMITATIONS

We aimed to be inclusive in examining evidence on barriers, facilitators, and implementation outcomes for a broad range of EBPs for chronic mental health conditions. But given our focus on those results that would be most applicable to VHA settings and the implementation of EBPs for chronic pain, we included EBPs that were recommended for eligible conditions and were available in VHA. Thus, we did not include EBPs that may be recommended for particular conditions but were not accessible in VHA. We also sought to focus on provider- and system-level barriers and facilitators for implementation of EBPs for chronic mental health conditions, due to the greater applicability of such results for implementation of EBPs for chronic pain. However, results often involved interrelationships between patient, provider, and system factors.

Additionally, some patient factors appeared consistent across the types of EBPs, such as transportation barriers and competing work and family responsibilities. Therefore, we elected to include results on patient-level barriers and facilitators for EBPs for chronic mental health conditions. We limited eligibility to English-language studies conducted in the US or in a small set of non-US countries with comparable economic, cultural, and public health contexts (Canada, UK, Ireland, and Australia). Although evidence from excluded countries would likely have been less applicable, it is possible that it may have provided some relevant information.

CONCLUSIONS

Studies of barriers and facilitators to EBPs for chronic pain focused largely on patient-level findings, with little provider- or system-level information. VHA training programs for a variety of EBPs for chronic pain and mental health conditions led to sustained effects on provider use of EBPs but with persistent concerns about level of uptake by patients who would benefit from these treatments, and maintenance of effects for providers who deliver these treatments. Shared barriers across EBPs included workload and scheduling challenges for providers; lack of educational resources and training for referring providers; transportation needs and competing responsibilities for patients; and variable patient buy-in to EBP rationale. Shared facilitators were leadership engagement; training and treatment delivery resources; communications and networks for continuing provider education; and positive patient-provider relationships. Future work is needed to explore heterogeneity of treatment effects within EBPs for chronic pain, as well as provider- and system-level barriers and facilitators for EBPs for chronic pain. Additionally, VHA national initiatives for EBPs have largely not focused on patient factors affecting uptake and heterogeneity in treatment. It may be useful to develop and disseminate patient educational materials to increase awareness and acceptability of EBPs. It will also be important to evaluate outcomes for alternative EBP delivery formats and modalities. At a provider and system level, VHA facilities may benefit from strategies to streamline EBP referral processes, and guidance for conducting local needs assessment on implementation readiness and matching of strategies and resources.

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APPENDIX A. SEARCH STRATEGIES

MEDLINE AND EMBASE

1	(barrier$1 or facilitat* or intervention$1 or audit* or feedback or academic detail$1 or implement* adj3 (intervention* or model* or plan* or process* or strateg* or system*) or approach* adj3 (collaborative or complementary or comprehensive or innovative or integrated) or Treatment uptake or intervention uptake or referral practice* or treatment preference* or engagement or disseminat* or adopt* or sustain* or acceptance or acceptability or feasibility or attitude* or Incentive structure* or allowance structure* or accreditation or plan do study act or needs assessment or learning collaborat* or credentialing or licensure or implementation blueprint or quality monitor* or resource sharing or champions or early adopters or opinion leaders or network weaving or local technical assistance or scale up or train*).ti,ab,kw
2	Practice patterns, physicians/ or attitude of health personnel/ or health services accessibility/ or patient acceptance of health care/ or clinical decision-making/ or physician-patient relations/ or patient participation/ or Reimbursement, Incentive/ or accreditation/ or needs assessment/ or credentialing/
3	1 or 2 (All implementation terms)
4	(veteran or veterans).ti,ab,kw
5	Veterans/ or Veterans Health/ or United States Department of Veterans Affairs/
6	4 or 5 (all veteran terms)
7	Integrated delivery system*.ti,ab,kw
8	Delivery of health care, integrated/
9	7 or 8 (all integrated delivery system terms)
10	6 or 9 (combined veteran and integrated delivery terms)
11	((chronic adj2 pain) or (pain and (musculoskeletal or (low adj back) or neck or shoulder or hip or knee or joint))).ti, ab, kw
12	Chronic Pain/ or low back pain/ or shoulder pain/ or back pain/ or musculoskeletal pain/ or neck pain/
13	11 or 12 (all pain terms)
14	((CBT or cognitive behavioral therap* or cognitive therap* or prolonged exposure therap* or cognitive processing therap* or problem?solving t* or cognitive psychotherapy* or ACT or (acceptance commitment therap*) or MBSR or (mindfulness?based stress reduction) or mindful* or meditat* or (psychological adj1 therap*) or (behavioral adj1 therap*)) or DBT or dialectical behavior* therap* or family therap* or couples therap* or implosive therap* or mind-body therap* or interpersonal therap* or contingency management or social skills training or motivational enhancement therap* or present?centered t*).ti,ab,kw
15	Cognitive Behavioral Therapy/ or Mind-Body Therapies/ or Implosive Therapy/ or Dialectical Behavior Therapy/ or Family Therapy/ or Couples Therapy/ or Implosive Therapy / or interpersonal psychotherapy/
16	14 or 15 (all intervention terms)
17	3 and 10 and 16 (Implementation terms, intervention terms, and veteran/integrated care terms)
18	3 and 13 and 16 (implementation terms, intervention terms, and pain terms)
19	17 or 18 (implementation and intervention terms with veteran/integrated delivery or pain terms)
20	Limit 19 to English language

CINAHL

1	barrier$1 or facilitat* or intervention$1 or audit* or feedback or “academic detail$1” or implement* N3 (intervention* or model* or plan* or process* or strateg* or system*) or approach* N3 (collaborative or complementary or comprehensive or innovative or integrated) or “Treatment uptake” or “intervention uptake” or “referral practice*” or “treatment preference*” or engagement or disseminat* or adopt* or sustain* or acceptance or acceptability or feasibility or attitude* or “Incentive structure*” or “allowance structure*” or accreditation or “plan do study act” or “needs assessment” or “learning collaborat*” or credentialing or licensure or “implementation blueprint” or quality monitor* or “resource sharing” or champions or “early adopters” or “opinion leaders” or “network weaving” or “local technical assistance” or “scale up or train*”)
2	(MH "Practice Patterns") or (MH "Attitude of Health Personnel") or (MH "Health Services Accessibility+") or (MH "Decision Making, Clinical+") or (MH "Physician-Patient Relations") or (MH "Consumer Participation") or (MH "Reimbursement, Incentive") (MH "Accreditation+") or (MH "Needs Assessment") or (MH "Credentialing+")
3	1 or 2 (All implementation terms)
4	veteran or veterans
5	(MH "Veterans+") or (MH "Veterans Health Services") or (MH "Hospitals, Veterans") or (MH "United States Department of Veterans Affairs")
6	4 or 5 (all veteran terms)
7	Integrated delivery system*
8	(MH "Health Care Delivery, Integrated")
9	7 or 8 (all integrated delivery system terms)
10	6 or 9 (combined veteran and integrated delivery terms)
11	(“chronic N2 pain”) or “musculoskeletal pain” (“low N1 back pain”) or “neck pain” or “shoulder pain” or “hip pain” or “knee pain” or “joint pain”
12	(MH "Chronic Pain") or (MH "Low Back Pain") or (MH "Shoulder Pain") or (MH "Back Pain+") or (MH "Neck Pain")
13	11 or 12 (all pain terms)
14	CBT or “cognitive behavioral therap*” or “cognitive therap*” or “prolonged exposure therap*” or “cognitive processing therap*” or “problem#solving t*” or “cognitive psychotherapy*” or ACT or “acceptance commitment therap*” or MBSR or “mindfulness#based stress reduction” or mindful* or meditat* or “psychological N1 therap*” or “behavioral N1 therap* or DBT or “dialectical behavior* therap*” or “family therap*” or “couples therap*” or “implosive therap*” or “mind-body therap*” or “interpersonal therap*” or “contingency management” or “social skills training” or “motivational enhancement therap*” or “present# centered t*”
15	(MH "Cognitive Therapy+") or (MH "Mind Body Techniques+") or (MH "Behavior Therapy+") or (MH "Dialectical Behavior Therapy") or (MH "Family Therapy") or (MH "Couples Counseling") or (MH "Interpersonal Psychotherapy")
16	14 or 15 (all intervention terms)
17	3 and 10 and 16 (Implementation terms, intervention terms, and veteran/integrated care terms)
18	3 and 13 and 16 (implementation terms, intervention terms, and pain terms)
19	17 or 18 (implementation and intervention terms with veteran/integrated delivery or pain terms)
20	Limit 19 to English language

PSYCINFO

1	(barrier$1 or facilitat* or intervention$1 or audit* or feedback or academic detail$1 or implement* adj3 (intervention* or model* or plan* or process* or strateg* or system*) or approach* adj3 (collaborative or complementary or comprehensive or innovative or integrated) or Treatment uptake or intervention uptake or referral practice* or treatment preference* or engagement or disseminat* or adopt* or sustain* or acceptance or acceptability or feasibility or attitude* or Incentive structure* or allowance structure* or accreditation or plan do study act or needs assessment or learning collaborat* or credentialing or licensure or implementation blueprint or quality monitor* or resource sharing or champions or early adopters or opinion leaders or network weaving or local technical assistance or scale up or train*).ti,ab,hw,id
2	Practice patterns, physicians/ or exp Health Personnel Attitudes/ or health services accessibility/ or patient acceptance of health care/ or clinical decision-making/ or physician-patient relations/ or exp Client Participation/ or Reimbursement, Incentive/ or accreditation/ or exp Needs Assessment/ or credentialing/
3	1 or 2 (All implementation terms)
4	(veteran or veterans).ti,ab,hw,id
5	exp Military Veterans/ or Veterans Health/ or United States Department of Veterans Affairs/
6	4 or 5 (all veteran terms)
7	Integrated delivery system*.ti,ab,hw,id
8	Delivery of health care, integrated/
9	7 or 8 (all integrated delivery system terms)
10	6 or 9 (combined veteran and integrated delivery terms)
11	((chronic adj2 pain) or (pain and (musculoskeletal or (low adj back) or neck or shoulder or hip or knee or joint))).ti,ab,hw,id
12	Chronic Pain/ or low back pain/ or shoulder pain/ or exp Back Pain/ or musculoskeletal pain/ or neck pain/
13	11 or 12 (all pain terms)
14	((CBT or cognitive behavioral therap* or cognitive therap* or prolonged exposure therap* or cognitive processing therap* or problem?solving t* or cognitive psychotherapy* or ACT or (acceptance commitment therap*) or MBSR or (mindfulness?based stress reduction) or mindful* or meditat* or (psychological adj1 therap*) or (behavioral adj1 therap*)) or DBT or dialectical behavior* therap* or family therap* or couples therap* or implosive therap* or mind-body therap* or interpersonal therap* or contingency management or social skills training or motivational enhancement therap* or present?centered t*).ti,ab,hw,id
15	exp Cognitive Behavior Therapy/ or exp Mind Body Therapy/ or exp Implosive Therapy/ or exp Dialectical Behavior Therapy/or exp Family Therapy/ or exp Couples Therapy/or exp Implosive Therapy/ or exp Interpersonal Psychotherapy/
16	14 or 15 (all intervention terms)
17	3 and 10 and 16 (Implementation terms, intervention terms, and veteran/integrated care terms)

APPENDIX B. ELIGIBILITY CRITERIA

INCLUSION CRITERIA

	KQ 1	KQ 2
Populations	Community-dwelling adults with chronic pain (*ie*, pain ≥ 3 months; described as “chronic pain”; or included pain conditions such as fibromyalgia or arthritis)	Community-dwelling adults with chronic mental health conditions
Interventions	• Cognitive behavioral therapy • Mindfulness-based stress reduction • Acceptance & commitment therapy	• Cognitive behavioral therapy • Mindfulness-based stress reduction • Acceptance & commitment therapy • Cognitive processing therapy • Interpersonal psychotherapy • Prolonged exposure therapy • Cognitive behavioral conjoint therapy • Contingency management • Couples & family therapy • Social skills training • Dialectical behavioral therapy • Present centered therapy • Motivational enhancement therapy • Problem solving therapy
Comparators	Any (active or inactive)	
Outcomes	Pre-implementation studies: • Patient-, provider-, and system-level barriers and facilitators	Pre-implementation studies: • Provider- and system-level barriers and facilitators
	Evaluations of implementation strategies: • Reach—uptake by target population • Effectiveness—patient outcomes, cost-effectiveness • Adoption—uptake by clinical staff (*eg*, participation in delivery, referrals) • Implementation—consistency and fidelity • Maintenance—sustainability	
Timing	Any duration	
Setting	Any outpatient setting (including telehealth or mobile technology) in US, UK, Ireland, Canada, or Australia	Integrated healthcare delivery systems, outpatient setting (including telehealth or mobile technology) in US, UK, Ireland, Canada, or Australia
Study Design	RCTs or observational studies	
Other	English language	

EXCLUSION CRITERIA

Populations	End-of-life (in hospice and/or ≤6 mo life expectancy); pain caused by advanced stage cancer (*eg*, bone metastases); receiving urgent or acute medical therapy for pain-causing condition (*eg,* chemotherapy, radiation, or surgery)
Interventions	Yoga, Taichi, Qigong
Settings	Acute care (*ie*, emergency rooms and inpatient floors) or institutional settings (*eg*, nursing homes)
Study Design	Reviews, study protocols, editorials, case reports

APPENDIX C. CONSOLIDATED FRAMEWORK FOR IMPLEMENTATION RESEARCH (CFIR) DEFINITIONS*

Topic/Domain	Definition	Short Code
I. Intervention Characteristics		
A. Intervention Source	Perception of key stakeholders about whether the intervention is externally or internally developed.	I-Source
B. Evidence Strength & Quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.	I-Evidence
C. Relative Advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.	I-Advantage
D. Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.	I-Adapt
E. Trialability	The ability to test the intervention on a small scale in the organization [8], and to be able to reverse course (undo implementation) if warranted.	I-Trial
F. Complexity	Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement	I-Complexity
G. Design Quality and Packaging	Perceived excellence in how the intervention is bundled, presented, and assembled	I-Design
H. Cost	Costs of the intervention and costs associated with implementing that intervention including investment, supply, and opportunity costs.	I-Cost
I. Group Dynamics	**For group treatments, interactions between participants (or with facilitator) that impact patient experience and/or outcomes**	**I-Group dynamics**
J. Patient-Therapist Dynamics	**Patient-therapist interactions during individual therapy that impact patient experience and/or outcomes**	**I-Patient-therapist dynamics**
II. Intervention Characteristics		
A. Patient Needs & Resources	Patient needs and resources (whether or not these are known to the health care system)	OS-Patient needs
B. Cosmopolitanism	The degree to which an organization is networked with other external organizations.	OS-Cosmo
C. Peer Pressure	Mimetic or competitive pressure to implement an intervention; typically because most or other key peer or competing organizations have already implemented or in a bid for a competitive edge.	OS-Peer pressure

D. External Policy & Incentives	A broad construct that includes external strategies to spread interventions including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.	OS-Ext policy
E. Patient Knowledge & Beliefs	**Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.**	**OS-Patient know**
F. Other Patient Attributes	**A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, priorities, competence, capacity, and learning style. Also includes demographics and other patient characteristics that do not fit under A or E above.**	**OS-Patient other**
G. General Practice Climate & Patterns	**Practices and models of care in the broad community of providers (outside of specific clinic or health system).**	**OS-General practice**
III. Inner Setting		
A. Structural Characteristics	The social architecture, age, maturity, and size of an organization.	IS-Structure
B. Networks & Communications	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.	IS-Networks
C. Culture	Norms, values, and basic assumptions of a given organization.	IS-Culture
D. Implementation Climate	The absorptive capacity for change, shared receptivity of involved individuals to an intervention and the extent to which use of that intervention will be rewarded, supported, and expected within their organization.	
1. Tension for Change	The degree to which stakeholders perceive the current situation as intolerable or needing change.	IS-Change tension
2. Compatibility	The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.	IS-Compatible
3. Relative Priority	Individuals' shared perception of the importance of the implementation within the organization.	IS-Priority
4. Organizational Incentives & Rewards	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary and less tangible incentives such as increased stature or respect.	IS-Incentives
5. Goals and Feedback	The degree to which goals are clearly communicated, acted upon, and fed back to staff and alignment of that feedback with goals.	IS-Goals
6. Learning Climate	A climate in which: a) leaders express their own fallibility and need for team members' assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try new methods; and d) there is sufficient time and space for reflective thinking and evaluation.	IS-Climate

E. Readiness for Implementation	Tangible and immediate indicators of organizational commitment to its decision to implement an intervention.	
1. Leadership Engagement	Commitment, involvement, and accountability of leaders and managers with the implementation.	IS-Leader engage
2. Available Resources	The level of resources dedicated for implementation and on-going operations including money, training, education, physical space, and time.	IS-Resources
3. Access to knowledge and information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.	IS-Knowledge access
F. Provider Decision-making	**Decision-making processes regarding referrals, selection of treatment options, etcetera (may be collaborative or shared-decision making).**	**IS-Provider decisions**
G. Patient-Provider Relationships	**Relationship or rapport between patients and clinicians outside of intervention context (eg, those making referrals to MH).**	**IS-Patient-provider**
IV. Characteristics of Individuals		
A. Knowledge & Beliefs about the Intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.	C-Knowledge
B. Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.	C-Self-efficacy
C. Individual Stage of Change	Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention.	C-Change stage
D. Individual Identification with Organization	A broad construct related to how individuals perceive the organization and their relationship and degree of commitment with that organization.	C-Org ID
E. Other Personal Attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.	C-Other attributes
V. Process		
A. Planning	The degree to which a scheme or method of behavior and tasks for implementing an intervention are developed in advance and the quality of those schemes or methods.	P-Planning
B. Engaging	Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modeling, training, and other similar activities.	
1. Opinion Leaders	Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention	P-Opinion lead
2. Formally appointed internal	Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention as coordinator, project manager, team leader, or other similar role.	P-Formal lead

implementation leaders		
3. Champions	"Individuals who dedicate themselves to supporting, marketing, and 'driving through' an [implementation]" [101](p. 182), overcoming indifference or resistance that the intervention may provoke in an organization.	P-Champions
4. External Change Agents	Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.	P-Ext agents
C. Executing	Carrying out or accomplishing the implementation according to plan.	P-Executing
D. Reflecting & Evaluating	Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.	P-Reflecting

[*] Bolded subdomains are novel adaptations for this project

APPENDIX D. ADAPTED QUALITY ASSESSMENT CRITERIA

OTTAWA-NEWCASTLE (MODIFIED)

Selection

1) Representativeness of sample
   a) Yes—representative of the population, with clear sampling strategy and rationale
   b) No—convenience sample, etc.
   c) Unclear—sample not described

2) Ascertainment of condition
   a) Medical record or clinical diagnosis
   b) Other
   c) Unclear—not described
   d) Not Applicable

Intervention

1) Implementation strategy and rationale
   a) Yes—strategy and rationale clearly described
   b) No—strategy not clear and/or no rationale provided
   c) not applicable

Outcome

1) Appropriate outcome assessment
   a) Yes—Data sources, variable definitions and rationale clearly described.
   b) No—measures/metrics not well described or use of inappropriate data sources

2) Follow-up and response rates
   a) Complete follow-up and/or adequate response rate (≥60%)
   b) High # lost to follow-up or inadequate response rate
   c) Unclear

3) For implementation trials (ie, testing specific strategy), was the follow-up sufficient for implementation outcomes (eg, sustainability, maintenance of effects)
   a) Yes—sufficient follow-up
   b) Not sufficient
   c) Not Applicable

Ethics

1) Has the relationship between researcher and participants been adequately considered?
   HINT: Consider
   • If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and study setting
   • How the researcher responded to events during the study and whether they considered the implications of any changes in the research design
   a) Yes
   b) Can't tell
   c) No

2) Have ethical issues been taken into consideration?

HINT: Consider

- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed any issues raised by the study (e.g. issues around informed consent or confidentiality, or how they handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

a) Yes
b) Can't tell
c) No

CRITICAL APPRAISAL SKILLS PROGRAMME (MODIFIED)

1. Was there a clear statement of the aims of the research?

HINT: Consider

- what was the goal of the research
- why it was thought important
- its relevance

a) Yes
b) Can't tell
c) No

2. Is a qualitative methodology appropriate?

HINT: Consider

- If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
- Is qualitative research the right methodology for addressing the research goal

a) Yes
b) Can't tell
c) No

3. Was the research design appropriate to address the aims of the research?

HINT: Consider

- if the researcher has justified the research design (e.g. have they discussed how they decided which method to use)

a) Yes
b) Can't tell
c) No

4. Was the recruitment strategy appropriate to the aims of the research?

HINT: Consider

- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g. why some people chose not to take part)

a) Yes
b) Can't tell

c) No

5. Was the data collected in a way that addressed the research issue?

HINT: Consider

- If the setting for the data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews are conducted, or did they use a topic guide)
- If methods were modified during the study. If so, has the researcher explained how and why
- If the form of data is clear (e.g. tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

a) Yes
b) Can't tell
c) No

6. Has the relationship between researcher and participants been adequately considered?

HINT: Consider

- If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

7. Have ethical issues been taken into consideration?

HINT: Consider

- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

a) Yes
b) Can't tell
c) No

8. Was the data analysis sufficiently rigorous?

HINT: Consider

- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

a) Yes

b) Can’t tell
c) No

9. Is there a clear statement of findings?

HINT: Consider whether

- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher’s arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than 1 analyst)
- If the findings are discussed in relation to the original research question

a) Yes
b) Can’t tell
c) No

APPENDIX E. PEER REVIEW DISPOSITION

	Reviewer Comments	Authors' Responses
Reviewer 2:		
2.1	*"I have generally only praise for this excellent report. I have no significant substantive concerns, and my comments are primarily editorial in nature.* *I note that the Executive Summary is over 30 pages, and the full report is about three times as long. If feasible, i think that it could be useful to try to shorten the Executive Summary to better isolate and highlight key findings. In particular, it seems possible to more succinctly present some of the details of the methods in the Executive Summary."*	Thank you. We have edited the Methods in the Executive Summary to be more succinct. Currently, the Methods are less than 2 pages and we note that we are reporting methods information that is strongly recommended for systematic reviews (*eg*, by PRISMA). We agree that the Executive Summary is on the longer side, but this is largely due to the amount of results that cover quite a broad scope across the 2 KQ.
2.2	*"I think that it would be helpful to add some background information, presumably from the HSR&D SOTA on nonpharmacological approaches to management of chronic musculoskeletal pain, that provides a justification and rationale for focusing solely on CBT, ACT and mindfulness approaches when examining the literature on evidence based approaches for management of chronic pain. That is, why were hypnosis, biofeedback, meditation and other self-regulatory approaches not considered, given that they each have evidence of efficacy for at least some subgroups of patients with chronic pain and since they are all in use in at least some VHA facilities?"*	We included CBT-CP, ACT, and MBSR since these EBPs have demonstrated efficacy for improving chronic pain outcomes (as noted by the HSR&D SOTA on non-pharmacological approaches to management of chronic musculoskeletal pain), are included in treatment guidelines for chronic pain and are being delivered in VHA settings, making implementation research a logical next step. We understood these priorities to be those of the requesting Operational Partners as well. We have commented on the rationale further in the Introduction and Methods. Several self-management strategies, and provider-delivered strategies not involving conscious psychotherapy with participants, have some evidence supporting their use as treatments for chronic pain. As these vary broadly with respect to roles of patients and providers, necessary technologies, and other clinical resources, it is likely that relevant barriers, facilitators, and implementation work would be distinct from those relevant to EBPs as well. Accordingly, these approaches to chronic pain care were considered beyond the scope of this review. Should these treatments be high priority for VA stakeholders, we would encourage that future systematic reviews to evaluate evidence for implementation of these self-management strategies and provider-delivered strategies beyond participatory psychotherapy.
2.3	*"Similarly, the expanded group of psychotherapies that were considered in addressing KQ2 might be justified. And, in interpreting the findings from this search, i think that it could be important to expand a bit on fairly obvious differences in some of*	We have edited the Discussion to expand on the differences of the KQ2 psychotherapy approaches relative to those employed for chronic pain management and have clarified that there may be different barriers and facilitators for therapies for non-pain conditions.

	Reviewer Comments	**Authors' Responses**
	these approaches (e.g., CPT and PE for PTSD) and those employed for chronic pain management. In this context, it seems likely that it could be important to acknowledge that, although depressive and anxiety disorders and PTSD commonly co-occur with chronic pain, they are distinct disorders with clinical characteristics that could be serve to elicit distinctly different barriers and facilitators for implementation and widespread adoption… "	
2.4	*"Consistently use CBT or CBT-CP; probably the former, since ACT and MBSR are not hyphenated when denoting that the intervention was for chronic pain.*	We agree that this distinction is important and that our search identified uses of CBT for chronic pain that might not formally be considered CBT-CP. In some articles, including those evaluating the national VHA rollout of CBT for chronic pain, CBT approaches were specifically described as a standardized form of CBT for chronic pain and abbreviated as CBT-CP (Stewart et al 2015, Murphy et al 2020, Higgins et al 2018). We have kept the term CBT-CP when referring to findings from those articles, and have removed the "CP" suffix from other mentions of CBT.
	Page 3, Line 60 – "Over half" not "galf."	This has been corrected.
	Be consistent in referencing "gender" and use "sex" only when referring to sex as a biological variable.	We agree it is important to use accurate descriptions of gender and sex. None of the included articles defined gender, sex, race or ethnicity, and most used secondary analyses of administrative or medical chart data. Accordingly, we could not independently determine whether gender or sex was assessed in the articles. We used gender or sex terminology consistent with the terms authors used to describe their results. We have edited Methods and Results to clarify this process and ensure consistency throughout the text. We have now noted in Results the finding that no included articles clearly defined sex, gender, race or ethnicity and that we could not verify the accuracy of these terms as applied to the data analyzed. We agree that there is significant concern regarding the use of how gender and sex are assessed and considered in analyses, and in the Discussion, we raised this issue with the published literature. We have added to our suggestions for future research the need to analyze these proxies, along with race and ethnicity, accurately and with clear purpose.
	Be consistent using "VHA" rather than "VA."	We have confirmed consistent use of "VHA" throughout the report. By convention, we refer to non-VA community settings, as these are entirely outside of VA programs (not just VHA facilities and clinics). We have also

	Reviewer Comments	**Authors' Responses**
	 Page 23 – Spell out acronyms (e.g., CBSST, MET).".”	used "VA" or "VHA" if this was part of participant quotes as reported by included studies. Per ESP Coordinating Center guidance, acronyms should be spelled out at first use and then abbreviated thereafter. We confirmed that all acronyms are spelled out at first use and included in the Abbreviations Table found at the end of the Executive Summary.
Reviewer 5:		
5.1	*"Page 11, Line 34 – Under "Key Results," it is noted first here (but several times in manuscript), that they included "cultural and communication barriers." I have searched the results and there appears to be only a single qualitative look at GPs impressions re: CBT on which this finding is based. The GPs (in the UK I believe) mention that a specific group (South Asians in this case) could perhaps be better served with more culturally sensitive materials/this approach may not work well for that culture. Since this is reported as a Key Finding, I thought this would at least be present in 2 studies and/or would be from a patient standpoint vs a GP opinion (who admittedly in the same study also said they did not fully understand CBT options) and/or would be more generalizable. While I am not arguing against this as a basic point in probably all treatment, since there is really not evidence to support it I am concerned about it being listed here as a key barrier to CBT.* *It seems important when it comes to key findings that it comes up in more than 1 study and has more generalizable implications. Or if it is from a single qualitative study to note it as you have below."*	We agree that Patel et al 2009 is the only study we found in which primary care providers noted cultural barriers to CBT use for chronic pain specifically. It is also the only study we found focused on primary care providers' perspectives regarding barriers to CBT use for chronic pain – and in that sense, 100% of such studies identified cultural barriers to CBT use for chronic pain. As we noted in the report, an additional study of CBT providers' perspectives on CBT use for other mental health conditions noted cultural and language barriers as a theme (Amodeo et al 2011). No studies explored roles of culture, race, sex, gender, or social factors in patients' own views or experiences of EBPs, and it is difficult to infer that this absence of evidence is evidence of absence. We do not use a quantitative criterion for determining key results. Even in reviews focused on data from randomized controlled trials, 1 large, high-quality study may be definitive in determining the key results. As much of the evidence in this review comes from qualitative studies, we find that quantifying the frequency of studies (as an indicator of the importance of reported results) to be potentially even more problematic. There were few studies that examined certain areas (*eg*, provider and system level factors for KQ 1), and studies varied greatly in comprehensiveness of evaluations. Thus, we used iterative rounds of discussion and consensus-building to arrive at our synthesis of results, with the goal of emphasizing those findings that are most likely to be important and/or point to key questions needing further research. We agree that current evidence are insufficient to indicate specific areas of need for cultural or social adaptations to EBPs. As the reviewer notes, additional research is needed to clarify roles of cultural and communication barriers in EBP uptake. We have edited the Executive Summary and Discussion to reflect this.

	Reviewer Comments	**Authors' Responses**
5.2	*"Page 35, Line 22 (Page 37, Line 4) – The heterogeneity in treatment response is mentioned several times in the manuscript; however, I could not find these differences summarized succinctly. The results re: demographics, etc. seemed highly variable re: possible impacts on treatment effects. Is it possible to explain in a more direct way about the heterogeneity in treatment response? Do these not work for most or for only certain groups, types of pain, etc.?."*	Heterogeneity in both treatment effects and treatment uptake is evident in research on EBPs, for chronic pain and for other behavioral health conditions, yet research on patient-level factors affecting both types of heterogeneity is limited to date. We found a wide range of patient-level factors related to uptake of EBPs for chronic pain, as noted in the report; some of these, such as patient beliefs about therapies or about pain, have especially plausible relationships to treatment effects as well. Our findings with respect to patient-level demographic factors related to treatment uptake were highly variable, as this reviewer notes and as we noted in the report. Further, as noted in the report and in comments above, conceptual and data-related definitions of many demographic variables were not well reported. More consistent and substantive assessment of heterogeneity in both treatment effects and treatment uptake, in both observational work and RCTs, can help clarify more patient-level targets for both effectiveness and implementation work – and can ensure clarity as to which factors affect treatment effectiveness, implementation, or both. We have edited the Executive Summary and Discussion to clarify these points.
5.3	*"Page 37, Line 56-57 – Since there was no information re: group implementation of CBT-CP and limited info on individual delivery of the other modalities, it seems that a future research interest may be gathering more of this data.*	We agree it is an important finding that no studies analyzed barriers, facilitators, or implementation strategies for group CBT for chronic pain, individual ACT for chronic pain, or individual MBSR for chronic pain. While MBSR was developed in a group format for chronic pain as well as for other mental health conditions, both CBT and ACT are provided regularly in both group and individual formats. We have edited the Implications section to draw more attention to the importance of group vs individual therapy formats in evaluation, and have edited the Research Gaps/Future Research section to indicate the need for future research on format-specific effectiveness and implementation work for both CBT and ACT for chronic pain.
5.4	*"Page 38, Line 11 – States to "Describe reach for EBPs associated with implementation strategies, such as VHA national training programs for EBPs" – What does this mean exactly and where would like to see it described? In general, the EBP Program has a transparent training structure, make available its information re: number of providers trained, etc. The tracking of encounters using many EBPs has been a challenge within VHA for a variety of reasons including IT barriers, etc. This may be more of an internal ask versus a future research question?"*	In our Discussion, we summarized findings regarding Adoption (eg, number of providers using EBPs) but also highlighted the need to evaluate Reach, defined as the number and representativeness of patients who are using the recommended treatments. As noted by the reviewer, there are challenges to assessing Reach, and we have added this consideration to the Discussion. However, we believe that Reach remains critical for evaluation of implementation strategies (within VHA and in the community). Additionally, we have expanded the RE-AIM definitions in the Methods to better distinguish between Adoption and Reach.

	Reviewer Comments	**Authors' Responses**
Reviewer 6:		
6.1	*"Minor comments p. 9, lines 8 through 17 – I recommend bold/italics for the key differences between KQ1 and KQ2 (e.g., chronic pain vs chronic mental health conditions). p. 10, line 60 – galf = half p. 11, lines 30/31 – should be "except" (instead of excepting) p. 21, lines 51/52 – need to remove 'd' from "received" p. 42, lines 7/8 to 9 – Phrasing is a little unusual, maybe change to, "Across 2011 and 2012, chronic pain was estimated…" p. 45, lines 17/18 – there is an underline before Consolidated that needs to be removed."*	We have bolded the words "chronic pain" (KQ 1) and "chronic mental health conditions" (KQ 2). We have also made the remaining corrections.
6.2	*Content-related comments p. 9, lines 17/18 – Why are not patient barriers mentioned as part of KQ2a? p. 10, lines 10/11 – RE-AIM is not specifically for evaluating implementation strategies per se, but implementation more broadly. Do you want to make that distinction?"*	In the Introduction, we have expanded on the rationale of including evidence on implementation of psychotherapies for non-pain conditions. Because the main goal of our stakeholders was to improve implementation of therapies for chronic pain, we considered that there would be more concerns with applicability of evidence for patient-level barriers and facilitators when these were non-pain populations. Therefore, KQ 2 focuses on provider and system-level barriers and facilitators. We have also added this clarification to the Methods (Topic Development in the main text). RE-AIM is 1 of several frameworks commonly used to guide evaluations of implementation of clinical and public health interventions (*eg*, see Hagedorn et al. *Addict Sci Clin Pract* 2014;9:12). Among the ones we examined, we also felt that it was the most helpful for organizing results from implementation evaluation studies.
6.3	*"p. 21, lines 7-9 – I realize you are looking at the effect of implementation strategies, but I think it would be good to provide a summary of the implementation strategies used in this section, before describing effects of implementation strategies. This also applies to p. 68 where this section starts in the body of the report."*	We have included a new subheading "Implementation Strategies Evaluated" to provide a summary of implementation strategies in both the Executive Summary and Results.
6.4	*p. 21, line 17 – you describe "uptake by target patient population." We usually refer to that as reach and not uptake in the implementation realm. Might be good to use reach, particularly since you're using RE-AIM."*	We now use the term reach to describe uptake by target patient population and adoption to describe adoption by clinical staff in the Executive Summary and Results Section.

	Reviewer Comments	Authors' Responses
6.5	*p. 22, lines 47/48 – I see you leave out "Reach." Was it really left out of the outcomes? If so, I would be more definitive about that in the last sentence of lines 44 to 45 and the accompanying section in the report. I see on p. 73 that these are the only adoption measures across implementation strategies.*	We have clarified in the Executive Summary and Results that no results in this classification group reported on Reach.
6.6	*p. 23, lines 3 to 7/8 - Your definition of adoption includes willingness to adopt, but self-efficacy is not quite that. Maybe this more of a facilitator? Positive attitudes has the same issue to me. This would of course need to be resolved throughout.*	For evaluations of implementation strategies, we categorized provider attitudes and self-efficacy within Adoption, as the most appropriate domain. As reported by study authors, these provider factors were assessed to improve understanding about why some providers will (or will not) use certain EBPs. Thus, they directly address the issue of Adoption, per the RE-AIM framework. We have clarified this classification in the Methods, and note it also in the relevant Results section.
6.7	*p. 68, line 44 – Would it be possible to start a new paragraph describing the implementation strategies used? I keep wanting that framing when reading about strategies. It is buried a bit and could be its own section describing definitions of implementation strategies.*	See response to #6.3 above
6.8	*p. 97, first bullet point - I think that you want to highlight that you recommend "tailored patient educational materials" based on your previous summary.*	We have revised this bullet to better align with the language used in the preceding summary paragraphs.
Reviewer 7:		
7.1	*Page 3, line 60 should read "...half..." (not "galf"); page 5, line 52 appears to be missing a word "...fit the program into their, but.."; page 12, line 59 appears to be missing a word "...first launched settings." Page 19, line 49 requires a capital letter (One) after a period.* *Page 21, line 21 "...use of adherence..." sounds awkward. Page 21, line 45 should read "...availability of PTSD treatments..."; Page 27, line 10 should read "skills" (not "kills");* *Page 65, line 43 should read "There were also more..."; Page 88, line 28 should read "...provider skills..."* *Page 29, line 29 recommends development/dissemination of patient educational materials - please note that the National EBP Training programs have developed/disseminated Veteran-facing brochures for each EBP offered, as well as a "Proven Treatments" brochure that provides a brief summary of all EBPs offered.*	We have made all of these corrections and edits. We appreciate this information and have added these resources to the range of patient-facing educational materials currently available. However, we believe that our recommendation for more tailored materials for different patient groups remains valid.

	Reviewer Comments	Authors' Responses
	Page 29, line 32 recommends evaluation of in-person vs TMH care. Please note that the National EBP Training Programs have begun evaluation of EBPs provided to Veterans via TMH vs in-person.	Thank you for this information. We have added to the Discussion that there are efforts underway.
Reviewer 8:		
8.1	*"Overall, I enjoyed reading this thorough treatment of the implementation literature in this area. It was well-written, and I appreciated the synthesis of a large amount of material to arrive at several clear, pertinent recommendations. Below are additional major and minor comments for consideration.* *Major comments:* *Page 1, line 41-43- "because some findings from implementation of EBPs to treat chronic mental health conditions may be applicable to implementation of EBPs for chronic pain". Consider adding an explanation that this may be especially true for studies conducted within the VA health system where provider and system factors are expected to be similar and may reveal some common factors (barriers, facilitators, or implementation strategies) that could be acted on at a systems level. It seems important to clarify the purpose of going beyond examining just EBPs for pain.* *Page 1, line 49- the scope of this report is wide-ranging, so it is necessarily difficult to organize. This paragraph stating the overall scope of the review was a bit confusing. It may be due to the sentence about "results on barriers and facilitators for these same EBPs but in the context of treating individuals with other conditions". The sentence was unexpected and interrupted the flow. A slightly different presentation or organization may be helpful here.* *Also, within this paragraph or prior to it, the point could be made that the EBPs chosen are part of the VA's EBP program and used to treat conditions that are commonly found in VA including insomnia, depression, and PTSD."*	Thank you. We have clarified in the Introduction in the Executive Summary and Introduction in the main text that within VHA, provider- and system-level barriers, facilitators or implementation strategies for EBPs for mental health conditions may generalize to chronic pain treatment. We have also reorganized and expanded the inclusion criteria for non-pain EBPs, including a strong evidence-base, inclusion in treatment guidelines, and common implementation and delivery in VHA settings.
8.2	*"CFIR* *I don't claim expertise in CFIR or RE-AIM, but there were a few places in the report where the classification of themes was not*	We have carefully reviewed publications and other references describing the selected frameworks, and "Patient Knowledge and Beliefs" and "Patient Other Attributes" are not existing CFIR domains (Damschroder et

	Reviewer Comments	Authors' Responses
	clear to me. Someone with experience with these frameworks should review the manuscript and provide their feedback on the use of the frameworks for classifying the themes in this review. For example, is it acceptable to create new CFIR subdomains? *Page 5, paragraph beginning line 5, the authors created new CFIR subdomains to describe the themes not present in CFIR, but "Patient Knowledge and Beliefs" and "Other Patient Attributes" are already CFIR subdomains."*	al. 2009 and Damschroder et al. 2011). CFIR has "Patient Needs and Resources" under Outer Settings, but no other subdomains that specifically address patient attributes. Modifying CFIR has also been done by other groups who found that adding patient-centered subdomains served the purpose of their work (Safaeinili et al. *Learn health Syst* 2019;4:e10201). Finally, some members of the ESP review team have prior experience with implementation research using these frameworks.
8.3	*Page 12, line 29- this new section of CBT interventions for other conditions could benefit from a sentence or two introduction or maybe be integrated into the EBPs for other conditions section. It isn't clear what the rationale is for presenting them separately. Later, as I continued to read it was clear that this grouping of studies focuses mostly on provider and system barriers and facilitators rather than patient level barriers and facilitators as the pain related EBPs did and that may be the reason for the separate grouping. Possibly if the rationale for the grouping is introduced earlier it may flow more for the reader.*	We have added a description of KQ 2a, which focuses on provider and system-level barriers and facilitators for EBP in chronic mental health conditions.
8.4	*Page 15-16-Adoption-Is this adoption? I have typically seen adoption defined by the number of clinicians or patients who use an intervention. Having said that, I'm not sure where else in the RE-AIM framework I would put this.*	As noted previously in response to reviewer #6, we categorized provider attitudes and self-efficacy within Adoption, as the most appropriate domain within RE-AIM. We agree with reviewer that provider attitudes and self-efficacy is not explicitly included in the definition of RE-AIM domains. However, as these are factors that contribute to why (and which) providers will use recommended EBPs, we believe these concepts fit best within Adoption.
8.5	*Page 30, line 27 about reach in VA programs. Great point and I would add that we don't understand who engages in treatments and which setting have the highest referral yield (the most patients who actually engage).*	We agree with the reviewer, and in particular for chronic pain psychotherapies, understanding Reach will also require more research into provider and system-level factors that impact referrals and treatment engagement. We have added these comments to the Discussion (Research Gaps/Future Research).
8.6	*"Minor comments:* *Page 1, line 36- consider 'reducing opioid related harms rather than reducing inappropriate opioid prescribing; Page 3, line 60- should be over half rather than half;* *Page 6, line 29-consider adding to the end of that sentence that acceptance is a core process of ACT; Page 8, line 34-consider*	We added language on the goals of the Pain/Opioid CORE to the Introduction. We have made the remaining suggested edits in the report.

	Reviewer Comments	Authors' Responses
	saying treatment attendance or engagement instead of adherence; Page 19. Line 49. One should be capitalized and have a space I front of it; Page 25, line 52 To support the VA HSR&D Pain/Opioid CORE's goal of identifying high priority research within implementation of nonpharmacological treatments."	
	Page 12, line 42- I wasn't sure what cognitive barriers meant here. Does this refer to cognitive deficits like dementia or is this something else?	The authors did not elaborate beyond "cognitive barriers to understanding CBT concepts" and therefore it is unclear if this refers to clinical conditions or difficulty understanding CBT concepts.

APPENDIX F. QUALITY ASSESSMENT FOR ELIGIBLE PUBLICATIONS

Appendix Table F1. Quality Ratings for Qualitative Studies Assessed with CASP

Author, Year	Was there a clear statement of the aims of the research?	Is qualitative methodology appropriate?	Was the research design appropriate to address the aims of the research?	Was the recruitment strategy appropriate to the aims of the research?	Was the data collected in a way that addressed the research issue?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	Overall study quality
Amodeo 2011[97]	Yes	Yes	Yes	Can't Tell	Can't Tell	No	Yes	Can't Tell	Yes	Low
Bee 2016[45]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Moderate
Brintz 2020[38]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Casey 2020[54]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Clarke 2017[42]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Moderate
Crisp 2016[44]	Yes	Yes	No	No	Can't Tell	No	Yes	No	Can't Tell	Low
Curran 2015[81]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	High
Doran 2019[61]	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Low
Fraser 2019[40]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	High
George 2017[43]	Yes	Yes	Yes	No	Can't Tell	Yes	Yes	Yes	Yes	Moderate
Hamblen 2015[102]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	High
Hundt 2015[70]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	High
Hundt 2018[62]	Yes	Yes	Can't Tell	Yes	Yes	No	Yes	Can't Tell	Yes	Moderate
Kauth 2010[89]	Yes	Yes	Yes	Yes	Yes	No	Yes	Can't Tell	Yes	Moderate
Koffel 2020[59]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	High
Koffel 2020[57]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	High
Kyrios 2010[98]	Yes	Yes	Can't Tell	Yes	Can't Tell	No	Yes	Can't Tell	Yes	Low

Author, Year	Was there a clear statement of the aims of the research?	Is qualitative methodology appropriate?	Was the research design appropriate to address the aims of the research?	Was the recruitment strategy appropriate to the aims of the research?	Was the data collected in a way that addressed the research issue?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	Overall study quality
Landes 2017[95]	Can't Tell	Yes	Can't Tell	Can't Tell	Can't Tell	No	Yes	Can't Tell	Yes	Low
Lu 2016[68]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Martinez 2015[56]	Yes	Yes	Yes	Yes	Yes	No	Yes	Can't Tell	Yes	Moderate
McCracken 2014[47]	Yes	Yes	Yes	Yes	Yes	No	Yes	Can't Tell	Yes	Moderate
Osei-Bonsu 2017[67]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	High
Patel 2009[49]	Yes	Yes	Can't Tell	Can't Tell	Yes	No	Yes	Can't Tell	Yes	Moderate
Possemato 2018[75]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	High
Sayer 2017[65]	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Moderate
Sommerfeld 2019[99]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Can't Tell	Moderate
Van Huet 2009[48]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Moderate

Appendix Table F2. Quality Ratings for Quantitative Studies Assessed with Newcastle-Ottawa

Author, Year	Representative of the population, with clear sampling strategy and rationale?	Ascertainment of condition	Implementation strategy and rationale clearly described?	Appropriate outcome assessment (datasources, variable definitions and rationale clearly described)?	Complete follow-up and/or adequate response rate (>60%)?	For implementation trials testing a specific strategy, was the follow-up sufficient for outcomes?	Was the data analysis sufficiently rigorous?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Overall quality rating
Brintz 2020[38]	No	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Unclear	Yes	Yes	Moderate
Chard 2012[87]	Yes	NA	Yes	Yes	No	Yes	No	No	No	Low
Charney2019[74]	No	NA	Yes	Yes	Unclear	Yes	Yes	No	Yes	Low
Clark 2009[94]	Unclear	Unclear	No	No	Unclear	No	No	No	Yes	Low
Crawford 2017[77]	No	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Yes	No	Yes	Moderate
Crisp 2016[44]	No	Medical record or clinical diagnosis	NA	Yes	No	NA	No	No	Yes	Low
Cully 2010[88]	Yes	NA	Yes	Yes	Yes	Yes	No	No	Yes	Moderate
Dedert 2020[73]	No	Medical record or clinical diagnosis	Yes	No	Unclear	NA	No	No	Yes	Low
DePhilippis 2018[100]	Unclear	NA	No	No	Unclear	Yes	No	No	Yes	Low
Doran 2019[61]	No	work at PTSD clinic	No	Yes	Unclear	NA	Yes	Yes		Moderate
Drapkin 2016[79]	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	Yes	High

Author, Year	Representative of the population, with clear sampling strategy and rationale?	Ascertainment of condition	Implementation strategy and rationale clearly described?	Appropriate outcome assessment (datasources, variable definitions and rationale clearly described)?	Complete follow-up and/or adequate response rate (>60%)?	For implementation trials testing a specific strategy, was the follow-up sufficient for outcomes?	Was the data analysis sufficiently rigorous?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Overall quality rating
Eftekhari 2015[82]	No	Medical record or clinical diagnosis	NA	Yes	Unclear	NA	Yes	No	Yes	Moderate
Finley 2015[71]	Yes	NA	NA	No	No	NA	Yes	No	Yes	Moderate
Finley 2018[63]	Yes	NA	NA	Yes	No	NA	Yes	No	Yes	Moderate
Garcia 2019[60]	Yes	NA	NA	Yes	No	NA	Yes	No	Yes	Moderate
Garcia 2020[101]	Yes	NA	NA	Yes	No	NA	Yes	No	Yes	Moderate
George 2017[43]	No	Unclear	NA	Yes	Yes	NA	Yes	No	Yes	Moderate
Heapy 2005[50]	Yes	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Yes	No	Yes	High
Hepner 2011[90]	Yes	Medical record or clinical diagnosis	Yes	Yes	Yes	No	Yes	No	Yes	Moderate
Herman 2017[55]	Yes	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Yes	No	Yes	High
Higgins 2018[41]	Yes	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Yes	No	Yes	High
Hundt 2018[62]	No	Unclear	No	Yes	No	NA	Yes			Low
Karlin 2010[91]	Yes	NA	Yes	No	Unclear	No	Unclear	No	Yes	Low

Author, Year	Representative of the population, with clear sampling strategy and rationale?	Ascertainment of condition	Implementation strategy and rationale clearly described?	Appropriate outcome assessment (datasources, variable definitions and rationale clearly described)?	Complete follow-up and/or adequate response rate (>60%)?	For implementation trials testing a specific strategy, was the follow-up sufficient for outcomes?	Was the data analysis sufficiently rigorous?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Overall quality rating
Karlin 2012[93]	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	Yes	Moderate
Karlin 2013[85]	Yes	NA	Yes	Yes	Yes	No	Yes	No	Yes	Moderate
Kauth 2010[89]	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	Yes	High
Kauth 2017[96]	Unclear	NA	Yes	No	Yes	Yes	Yes	Yes	No	Moderate
Kerns 2000[51]	Yes	Medical record or clinical diagnosis	NA	Yes	Unclear	NA	Yes	No	Yes	Moderate
Koffel 2018[52]	Yes	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Yes	No	Yes	High
Kyrios 2010[98]	Unclear	NA	NA	No	Unclear	NA	No	No	Yes	Low
Manber 2013[92]	Yes	NA	Yes	Yes	Yes	No	No	Yes	No	Moderate
McCracken 2014[47]	Yes	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Unclear	No	Yes	Moderate
Mignogna 2014[86]	No	Medical record or clinical diagnosis	Yes	Yes	Yes	Yes	Yes	No	Yes	Moderate
Mun 2019[39]	Yes	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Yes	No	Yes	High

Author, Year	Representative of the population, with clear sampling strategy and rationale?	Ascertainment of condition	Implementation strategy and rationale clearly described?	Appropriate outcome assessment (datasources, variable definitions and rationale clearly described)?	Complete follow-up and/or adequate response rate (>60%)?	For implementation trials testing a specific strategy, was the follow-up sufficient for outcomes?	Was the data analysis sufficiently rigorous?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Overall quality rating
Murphy 2020[37]	No	Medical record or clinical diagnosis	NA	Yes	No	NA	Unclear		Yes	Moderate
Possemato 2018[75]	Yes	PCL-S score	Yes	Yes	Yes	Yes	Yes	No	Yes	High
Raza 2015[69]	Yes	NA	NA	Yes	No	NA	No	No	Yes	Moderate
Richards 2017[66]	No	NA	Yes	No	No	NA	Yes	No	No	Low
Rosen 2017[76]	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	Yes	High
Ruzek 2014a[83]	Yes	NA	Yes	Yes	No	Yes	Yes	No	Yes	Moderate
Ruzek 2014b[72]	No	NA	NA	Yes	Yes	NA	No	No	No	Low
Ruzek 2016[80]	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	Yes	High
Ruzek 2017[78]	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	Yes	High
Song 2020[58]	Yes	NA	NA	No	No	NA	Yes	No	Yes	Moderate
Stewart 2015[24]	Yes	Medical record or clinical diagnosis	Yes	Yes	Yes	Yes	Unclear	No	No	Moderate
Thorn 2011[53]	Yes	Medical record or clinical diagnosis	NA	Yes	Yes	NA	Yes	No	Yes	High
Ulmer 2017[64]	Yes	NA	NA	Yes	No	NA	Yes	No	Yes	Moderate
Walser 2013[84]	Yes	NA	Yes	Yes	Yes	No	Yes	No	Yes	High

Author, Year	Representative of the population, with clear sampling strategy and rationale?	Ascertainment of condition	Implementation strategy and rationale clearly described?	Appropriate outcome assessment (datasources, variable definitions and rationale clearly described)?	Complete follow-up and/or adequate response rate (>60%)?	For implementation trials testing a specific strategy, was the follow-up sufficient for outcomes?	Was the data analysis sufficiently rigorous?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Overall quality rating
Wetherell 2016[46]	Yes	Study staff evaluation of participants	NA	Yes	Yes	NA	Yes	No	Yes	High

APPENDIX G. EVIDENCE TABLES

Appendix Table G1. KQ1 Articles Examining Facilitators and Barriers to Implementation of CBT, ACT, and MBSR for Chronic Pain

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting—Patient Knowledge and Beliefs	**Outer Setting—Other Patient Attributes**	**Others**
Cognitive Behavioral Therapy (CBT)				
Bee, 2016[45] Moderate UK community health system	44 adults who completed follow-up in RCT comparing exercise, 8 weeks of individual tCBT, exercise + tCBT, and UC Fibromyalgia or CWP per ACR definition; impaired physical function per CPGQ; GP consultation for pain within past 12 months Semi-structured interviews, framework analysis	*"Patients emphasized a lack of personal understanding regarding their own pain triggers, a situation that they believed had been exacerbated by poor information provision and a lack of clinical consensus regarding the CWP experience. In the absence of a clear causal attribution for CWP, participants tended to conceive pain in physical terms, typically describing it as a natural warning system initiated in response to mechanical stress or dysfunction."* *"…in almost all cases pain was experienced in cyclical episodes with no perceived control over their beginning or end. By implication, there was also no perceived control over the occurrence of future pain events. Sharing these experiences with others was difficult for some individuals, who ultimately feared that they would be regarded as lazy, or that the validity of their symptoms would be dismissed."*		**Intervention Characteristics—Design Quality and Packaging** *"Negative feedback…focused predominantly on the relevance of intervention resources. All* [CBT] *participants… were issued…a self-help manual. While diaries and written exercises were sometimes… useful, hypothetical case studies and lifestyle scenarios attracted criticism for their bias towards inactive and isolated individuals. …* [T]*he severity of the examples provided constituted an unnecessary and unwelcome reminder of potential identity loss for many. Engaging fully with therapy materials meant that participants had … to acknowledge this possibility and to perceive some relevance between the case*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
		"Only a small minority of patients reported pre-emptive adjustments to CWP, the deliberate use of activity pacing or practical lifestyle aids reflecting an unusual level of self-efficacy in the patient role." *"Lack of relevance* [of CBT, as compared to exercise]*… included … two key factors: a lack of fit with participants' entrenched illness perceptions and a lack of fit with the self. Participants' narratives revealed a lack of knowledge regarding the goals … of CBT and thus an initial lack of understanding regarding its 'fit' with a health condition predominantly attributed to physical causes:"* *"… substantial stigma surrounded CBT use. At best, psychological therapy was perceived to question the validity of pain symptoms. At worst, it intimated the CWP was the result of an underlying character weakness requiring some sort of correction."* *"Participants who had denied or challenged pain recounted how they had gradually begun to re-engage with their condition … Most believed that by engaging cognitive reflection they had been able to enhance their own understanding of pain triggers, thereby*		*studies and their own social and illness identities."* **—Patient-Therapist Relationship:** *"Several expressed relief at being able to share previously untold illness experiences. Many reported that direct interaction with a cognitive behavioural therapist had enabled them to benchmark their current daily routines and activity levels against social norms and identify potential self-care opportunities."* **Outer Setting—Patient Needs and Resources:** *"Telephone…was sometimes acknowledged to limit face to face interaction, limiting the depth of the relationship that could be established between a therapist and client. For the most part however, the impact of using a* [telephone] *was relatively minor. The key gains lay in its ability to overcome geographical or temporal access barriers, and to deliver timely and responsive behavioral change interventions into a contextually relevant setting."*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting—Patient Knowledge and Beliefs	Outer Setting—Other Patient Attributes	Others
		shifting …to proactive pain management strategies."		
Fraser, 2019[40] High UK community health system	33 adults who completed ≥50% of 7-week tCBT pain program in RCT of tCBT vs UC High risk of developing CWP: consulted GP for pain in past 6 months, + 2 or 3 of the following: Illness Behavior Scale Score >4, Somatic Symptom Scale Score >2, Sleep Problem Scale Score >4 Semi-structured interviews, framework analysis	*"Some patients appeared to have assessed the potential for gain versus risk when considering whether to participate in the study and judged it to be a non-invasive, low risk, 'nothing to lose' opportunity and an alternative to medication."* *"Prior to the first session about a third of participants had fairly low expectations about what the intervention could achieve for them, either due to skepticism about how talking could impact on a physical symptom or because they had doubts about the relevance of this approach for their particular condition."* *"About a fifth of participants had a good understanding of cognitive behavioral approaches and began the trial with high expectations about the benefits of talking therapy in relation to pain management, either based on prior experience of CBT (for other health conditions) or from their own reading or professional roles."* *"For the participants reporting positive changes [in either their subjective level of pain or their pain management] directly attributed to the*	*"A small number of participants had already adopted their own discomfort and pain self-management strategies, for example, positive thinking, exercising, pacing or resting prior to involvement in the trial and these were used by them to minimize the impact of the pain experienced"*	**Intervention Characteristics—Design Quality and Packaging** *"All participants confirmed they had received the accompanying self-management CBT manual and about two thirds reported using it. Many positive aspects of the manual were identified relating to the content, structure and purpose. For example, participants used the manual as an aide memoire between sessions, to recall sessional advice and to prompt and motivate their daily goals. Notes could also be made for topics to be discussed with the therapist at the next session which could help participants to articulate their thoughts."* *"The manual was also important for some in helping to foster the connection between mind and body and principles of CBT and in enhancing their understanding*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
		intervention, nine of these reported lower or more manageable levels of pain which seemed to relate to an increase in self-awareness and self-management of symptoms and evidence of cognitive re-structuring.” *“For the remainder of the participants reporting positive changes [in either their subjective level of pain or their pain management] directly attributed to the telephone intervention their pain was still present but they had changed the way they thought about their pain and were now able to “put things in perspective”, “think of others worse off” or to focus less on the pain.”* *“…the trial was felt to be unsuitable as the participant did not consider their main source of pain to be musculoskeletal although they did have a diagnosis of osteoporosis; in three other cases the intervention was considered to have effected little or no change as the participants were already using cognitive and pain management strategies prior to being recruited into the trial.”* Patient-reported factors affecting intervention acceptance→ Patient-suggested methods to address these factors:		*of pain triggers in order to identify solutions.”* *“In suggesting ideas to improve the manual some had found it ‘difficult to navigate’ and others ‘repetitive’ or ‘too rigid’ – which was contrasted with the personalized and adaptable approach of the therapist. Some would have liked more information at the outset about the purpose of the manual alongside the therapeutic sessions and how this would be used by the therapist and client throughout the intervention. Ultimately though, what was important was that the manual was offered alongside the therapeutic support of the therapist.”* **—Patient-Therapist Dynamics** *“Interviewees commented warmly on the therapists delivering the sessions, describing them as experienced and skilled professionals who were friendly, knowledgeable, empathic and able to quickly*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
		Skepticism and resistance: Some will be skeptical and resistant to the idea of a 'counselling' approach to preventing chronic widespread pain→ Clear information at screening about the nature and style of the intervention (cognitive behavioral therapy) and about the link between what we do, the way we think and our physical symptoms Timing: Timing of the intervention offer could impact on acceptability and suitability→ impact may be increased if offered earlier rather than later, for example, when participants are experiencing low to moderate pain Baseline Knowledge: Intervention most useful for those with little or no prior experience techniques of CBT pain management techniques→ Intervention screening should include assessment of baseline knowledge and existing use of self-help and CBT pain management Presenting Symptoms: The presenting symptoms experienced may impact on acceptability and suitability →Intervention screening should include assessment of symptoms experienced. Intervention is likely to be most helpful for those with musculoskeletal pain.		*establish rapport and put clients at ease. Participants also welcomed the consistency, reliability and convenience of speaking to the same therapist at each session."* *"For those who had no prior experience of therapeutic support, this down to earth and personalized approach was a welcome contrast to what they had been expecting."* *"Participants also valued having someone to share their experience with, without which, the pain could have been an isolating experience."* "*Others highlighted the contrast between the trial intervention and usual GP care, highlighting that taking part was an opportunity to be listened to, to be given time to talk."* **Outer Setting—Patient Needs and Resources** *"…more than two thirds were completely satisfied with*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
				receiving this type of intervention by telephone and saw no additional benefits to be gained by receiving the intervention face-to-face.” *“The telephone-based intervention also increased accessibility for those who were working and/or had childcare commitments and those who were geographically remote from NHS clinic sites.”* *“Some participants had mixed views on modality: whilst recognizing some of the benefits that telephone interventions can offer, they wondered whether face-to-face support would achieve a more personal and holistic approach and enhance the therapeutic process, for example, by incorporating non-verbal communication. Two participants felt the telephone did not afford a sufficiently in-depth approach as compared to a face to face approach.”*
Heapy, 2005[50]	89 adults (1 primary care clinic) in RCT of 10	Pre-contemplation: higher ~ little personal responsibility for pain	• Patients who did not complete all treatment sessions	

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
High US, VHA	weeks primary-care-based CBT (PRIME) vs CBT vs UC Constant pain ≥6 mo and "significant physical findings" at pain site per chart review Questionnaires Descriptive statistics, correlations, ANCOVA and repeated measures ANOVA, hierarchical regression	control and no interest in making behavioral changes that support pain management. Contemplation: higher ~ increasing recognition of personal responsibility for pain control and interest in behavioral changes that support pain management. - Contemplation correlated with higher adherence (r 0.399, $p<0.01$) - Pre-contemplation correlated with lower adherence (r -0.331, $p<0.05$) - Action, maintenance, self-efficacy not correlated with adherence - Self-efficacy did not account for a significant amount of variance in adherence - PSOCQ variables accounted for significant amount of variance in adherence, controlling for self-efficacy (R^2 change 0.234, $p<0.05$) - None of self-efficacy, individual PSOCQ variables, or PSOCQ model variables as a block significantly predicted variance in post-treatment goal accomplishment.	reported more baseline pain-related interference than completers (WHYMPI Interference score 5.33 vs 4.64, $p<0.01$). - No significant differences between completers and non-completers on any other demographic, mood, pain, or other outcome variables (age, sex, race, employment, service connection, retirement, relationship status, depressive symptoms (BDI-II), state anxiety, GPR, pain severity (subscale of WHYMPI), pain-related disability (subscale of WHYMPI), pain medication use, history of pain surgery, or pain duration)	

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
		Adherence change over time: Increase in combination in all PSOCQ variables was • significantly related to increase in adherence from mid (average of weeks 4-6) to late (7-10) (R^2=.216, p=0.041) treatment • not significantly related to increase in adherence from early (average of weeks 1-3) to late (7-10) treatment Pre-contemplation decrease was associated with adherence decrease (effect size NR, t=-2.350, p=0.024), though direction is opposite of expected Maintenance increase was associated with adherence increase (effect size NR, t=-2.270, p=0.029) Adherence was not a mediator • between PSOCQ and pain-related outcomes (pain severity, interference, BDI) • between SE and goal accomplishment Adherence mediated the influence of Contemplation on goal accomplishment (Sobel test: z=2.48, p<0.01)		

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
Mun, 2019[39] High US, VHA	60 adults (1 primary care clinic – VA Connecticut Healthcare System Primary Care Clinic) enrolled in 10 weeks one-on-one primary-care-based (PRIME) CBT or CBT arms within RCT of PRIME CBT vs CBT vs UC Constant back pain ≥6 mo and "significant physical findings" at pain site per chart review Questionnaires Descriptive statistics, repeated measures ANOVA, change score correlations and multiple variable regression	Action represents acceptance of a self-management approach to chronic pain and engagement in efforts to improve pain management skills. Maintenance represents an established self-management perspective and desire to continue learning and applying pain management skills. As Action and Maintenance scales were highly correlated ($r = 0.74$), mean scores of Action and Maintenance scales were combined for main analyses. Action/Maintenance change scores were significantly positively correlated with intersession adherence (r 0.34, $p < 0.05$), indicating that increased Action/Maintenance was associated with greater intersession adherence on average	Patients who completed the 12-month follow-up (completers) and those who dropped out (non-completers) did not differ significantly on baseline variables including age, years of education, sex, race/ethnicity, living alone vs with others, employment status, pain duration, history of pain surgery, depression symptom severity (BDI-II), pain-related disability (RMDQ), or pain severity (subscale of WHYMPI)	
Higgins et al 2018[41] High US, VHA	290 adults (Northeastern VA health care system) in RCT of 10 weeks in-person one-on-one vs interactive voice-response one-on-one CBT-CP		No statistically significant difference in race/ethnicity, age, gender, or pain intensity (NRS) between participants who did and did not receive adequate dose (≥3 weeks) of treatment	

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting— Patient Knowledge and Beliefs	Outer Setting— Other Patient Attributes	Others
	Neck or back pain ICD-9 code(s) (CPT 721, 722 or 724) in EHR and ≥ 4 on pain intensity numerical rating scale (NRS, 0-10) for ≥3 months EHR/chart review, interviews, questionnaires/surveys Descriptive and bivariate statistics, multivariate logistic regression, Kaplan-Meier			
Kerns, 2000[51] Moderate US (VHA)	109 adults (Connecticut Healthcare System) evaluated for 10 sessions of one-on-one CBT that could involve a significant other Pain ≥4 months, not seeking new medical treatment for pain Treatment completers vs non-completers of CBT Interviews, questionnaires/surveys Descriptive statistics, bivariate analyses, two-way MANOVA and post-hoc univariate statistics	For patients who completed treatment, as compared to non-completers, pre-treatment mean scores were significantly lower for Precontemplation (2.93 vs 3.27, p<0.05), were significantly higher for Contemplation (3.84 vs 3.61, p<0.05), and did not differ on Action or Maintenance scores	No significant differences noted between completers and non-completers in demographic characteristics (age, education level, percent male [neither sex nor gender named], employed vs unemployed) or pain and mental health measures (pain severity by 2 measures (PRI; subscale of WHYMPI), pain disability (subscale of SOPA), pain interference (subscale of WHYMPI), activity (measure NR), pain behavior (PBCL), depression severity (BDI), pain duration, number of medical outpatient visits for pain, number of medical inpatient visits for pain, number of psychiatric visits, number of visits to other pain care providers, % using prescribed or	

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting—Patient Knowledge and Beliefs	**Outer Setting—Other Patient Attributes**	**Others**
			OTC pain medications, % receiving disability for pain)	
Koffel, 2018[52] High US community health system	122 adults ≥60 years old with clinically significant insomnia (Washington state primary care clinics, integrated health system) randomized to 6 weekly sessions of group CBT-PI in RCT of CBT-PI vs CBT for chronic pain vs EOC ICD-9 diagnosis of osteoarthritis (CPT 715xx) on ≥1 health care visit in 3 years prior to screening and clinically significant pain (Grade II, III, or IV on GCPS) Questionnaires/surveys Descriptive statistics, exploratory factor analyses, hierarchical regressions	Treatment Acceptability Scale consists of 4 items: treatment made sense, is acceptable, is suitable, is expected to be effective Treatment Acceptability Scale was positively correlated with total number of sessions attended (r 0.24, p≤0.01) and negatively correlated with 2-month drop-out (-0.32, p≤0.01) Hierarchical regressions: Higher treatment acceptability predicted higher treatment session attendance (ß 0.20, ΔR^2 0.03, p<0.05). Treatment acceptability was the last addition to the model, and therefore predicted an additional 3% of the variance above and beyond baseline demographics, medical variables and symptoms. Opioid use at baseline was the only other significant predictor in the final model.	Opioid medication use for pain at baseline was negatively correlated with total number of sessions attended (r -0.24, p≤0.01) Patients who dropped out prior to the 2-month post-treatment assessment did not differ significantly from patients who completed the intervention on baseline demographics (age, sex, race, marital status, education beyond high school), chronic medical illness (Charlson Index 0 vs >0), current use of medication types (hypnotics, opioids, non-opioid analgesics), pain measures (GCPS, AIMS2-SF-Symptom, PCS, TSK), anxiety/depression measures (GDS, AIMS2-SF-Affect), insomnia measures (ISI, PSQI, FFS, DBAS), or objectively measured sleep variables (total sleep time, sleep efficiency) Hierarchical regressions: Patients who were taking opioid medications for pain at baseline attended fewer treatment sessions (ß=-0.21, p<0.05)	
Murphy et al 2020[37]	1331 adults (across national VA health care		Treatment completion (≥11 sessions) was more likely in	

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<tr><th rowspan="2">Author, Year;
Quality;
Setting</th><th rowspan="2">Participants;
Chronic pain definitions;
Data sources and analyses</th><th colspan="3">Outcomes by CFIR Domain</th></tr>
<tr><th>Outer Setting—
Patient Knowledge and Beliefs</th><th>Outer Setting—
Other Patient Attributes</th><th>Others</th></tr>
<tr><td>Moderate
US, VHA</td><td>system) who initiated individual CBT-CP treatment
Presented to a clinical care setting with complaint of chronic pain and/or pain-related impairments
Questionnaires
Descriptive statistics, logistic regressions</td><td></td><td>Veterans with advanced age (OR 1.01 for 1 year, 95%CI 1.002-1.023) and with lower baseline pain-related interference (subscale of WHYMPI) (OR 1.19, 95%CI 1.06-1.34). No significant difference between completers and non-completers in other sociodemographic values (age, gender, race, ethnicity, highest education level completed, military service era), baseline pain measures (NRS, PCS), baseline depression severity (BDI-II, PHQ-9) or quality of life measures (WHOQOL physical, psychological, social and environmental domains)</td><td></td></tr>
<tr><td>Patel, 2009[49]
Moderate
UK community health system</td><td>18 GPs practicing primary care, asked about chronic pain care for South Asian patients
No chronic pain definition; GPs had practiced ≥12 months in the city area
Semi-structured interviews, constant comparative method of grounded theory</td><td></td><td></td><td>Intervention Characteristics —Evidence:
<i>“GPs seemed particularly interested in having access to more culturally relevant psychological services including counselling and CBT. Most current pain management programs are derived from a CBT approach that has been shown to be effective…and have been described as the treatment of choice for patients coping with pain-related disability… However, it is important to</i></td></tr>
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Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting—Patient Knowledge and Beliefs	Outer Setting—Other Patient Attributes	Others
				bear in mind that these research data come almost exclusively from European populations, people of European descent or western countries.” **Outer Setting—Patient Needs and Resources:** *“From the interviews we found GPs felt the additional services required for South Asian patients with chronic pain included counselling, cognitive behavior therapy (CBT), and local community support.”* *“A number of GPs felt the underlying issues for patients with chronic pain were often psychosocial and as a result felt there was a need for more culturally specific psychological services. Some felt access to language specific counselling services may be beneficial in helping address some of these barriers.”* *“They perceived counselling to be a complex interaction*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
				between the counsellor and the patient therefore requiring the counsellor to communicate fluently in the patient's own language." **Inner Setting – Resources** *"GPs were aware that there are not enough trained counsellors with South Asian language skills and a thorough cultural understanding; therefore, this would be difficult to achieve."* **Characteristics of Individuals—Knowledge and Beliefs:** *"The challenges of secondary care pain management and a mismatch between GPs' understanding of services and the actual availability was also highlighted."* *"GPs had some degree of understanding of how CBT could play a role in helping these patients manage their pain. However, they felt the current health service provision was limited and for this patient group or either*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting—Patient Knowledge and Beliefs	Outer Setting—Other Patient Attributes	Others
				inadequate or culturally inappropriate." *"GPs were positive about the availability of CBT but were not fully aware of the details and the services that are or will be available:"*
Thorn, 2011[53] High US community health system	109 adults (patients in rural Alabama health care clinics) in RCT of 10-week group CBT vs EOC Experienced pain most days of the month for the previous 3 months Interviews, questionnaires Descriptive statistics, bivariate analyses, ANOVA	As compared to participants who completed treatment, participants who eventually dropped out • Recalled prior session material less accurately (effect size NR, F(1,75)=18.19; $p<0.01$; $\eta^2=0.195$) • Had significantly lower post-session recall scores (effect size NR, F(1,80)=44.66; $p<0.01$; $\eta^2=0.358$). • [Assessed in CBT arm only] Had significantly poorer performance on homework (effect size NR, F(1,44)=4.38; $p<0.05$; $\eta^2=0.090$)	As compared to people who completed all 10 sessions, people who did not complete the intervention • had lower mean income (under vs over $13,000 annually, F(1,83)=9.48; $p<0.01$; $\eta^2=0.105$) • had fewer years of education (mean 11.8 vs 13.1, $p<0.02$) • did not differ significantly on age, WRAT percentile, miles traveled to reach session sites, or pre-treatment BPI-pain severity, BPI-interference, CESD, RMDS, QOL, or PCS	
Van Huet, 2009[48] Moderate Australian community health system	15 adults who previously completed a CBT-based pain management program Past completion of chronic pain	*"Whilst all participants acknowledged their need to seek help to manage pain, some participants were already attuned to considering behavioral change while others were not."* *"Some participants saw 'not talking about pain' [avoidance of focus on*		**Outer Setting - Patient Needs and Resources:** *"Some participants had learnt and practiced the technique [pacing] during the program but were unable to use it practically once at home and*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
	management program (PMP) Standard chronic pain definition not reported. At time they completed PMP, participants had pain for an average of 93 months (range 18-300) Semi-structured interviews, thematic analysis of narratives	*pain, refocusing on self-efficacy and self-management] as a valuable way of managing their pain… others thought it to be counter-productive to moving forward in the pain management process.”* *“A few participants perceived the use of CB techniques as ‘brain washing’ and were aware of their reinforcement of these methods throughout the program, which they felt was unnecessary.”* *“Some participants saw the use of these methods as counterproductive to working through pain issues and noted that the group-based program had not met their individual needs.”* *“For some PMP participants, CB methods provided a framework to facilitate positive change. For others the concepts could not be adopted or maintained when living with unremitting pain. This appeared to be related to individuals’ readiness to adopt the PMP’s beliefs and attitudes about pain.”*		*engaged in a multitude of daily tasks.”*
CBT vs ACT				

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting—Patient Knowledge and Beliefs	Outer Setting—Other Patient Attributes	Others
Wetherell et al 2016[46] High US VHA and community health system	114 adults in RCT of 8-week group ACT vs 8-week group CBT Non-malignant pain ≥6 months, ≥5 on BPI interference and severity subscales Intake interviews, questionnaires Bivariate statistics, ANOVA		No statistically significant difference across age groups (young: 18–45 years old; middle age: 46–64; older ≥65) in % dropout, mean number of sessions attended, mean credibility (definition NR), mean treatment satisfaction (CSQ), % expecting improvement (5-item questionnaire)	
CBT and MBSR				
Herman et al 2017[55] High US community health system	342 adults (large health plan in Washington State) in RCT of 8 weeks group MBSR vs group CBT vs UC Low back pain ≥3 months; self-rated bothersomeness ≥4 (0-10) and pain interference with activities ≥3 (0-10) during previous 7 days Telephone interviews, questionnaires, EHR review Cost-effectiveness analysis: costs, QALYs, healthcare utilization			**Costs** MBSR vs UC: mean total 1-year per-participant societal costs -$724 (95% CI −$4386, $2778); mean total 1-year per-participant healthcare costs to the payer -$982 (−$4108, $1301); QALY gain of 0.034 (0.008, 0.060) CBT vs UC: mean total 1-year per-participant societal costs $125 (95% CI -$4103, $4347) versus UC; mean total 1-year per-participant healthcare costs to the payer $495 (−$2741, $3550); QALY gain of 0.041 (0.015, 0.067). The incremental cost-effectiveness ratio for CBT over UC was

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Quality;
Setting</th><th rowspan="2">Participants;
Chronic pain definitions;
Data sources and analyses</th><th colspan="3">Outcomes by CFIR Domain</th></tr>
<tr><th>Outer Setting—
Patient Knowledge and Beliefs</th><th>Outer Setting—
Other Patient Attributes</th><th>Others</th></tr>
<tr><td></td><td></td><td></td><td></td><td>$3049/QALY, well below the $50,000/QALY threshold for cost-effectiveness

MBSR had 90% probability of costing <$50,000/QALY, and CBT had 81% probability of costing <$50,000/QALY, in societal cost-QALY bootstrap analyses

Back pain-related healthcare costs show the same pattern as seen in overall healthcare costs: an increase in healthcare costs over UC for CBT and a reduction for MBSR

Both CBT and MBSR reduced non-back related healthcare costs compared to UC. CBT reduced these costs by an average of $489 ($984 minus $495) per participant, and MBSR reduced these costs by an average of $855 (−$127 minus −$982) during the study year

No significant difference between MBSR and UC, between CBT and UC, or between MBSR and CBT in</td></tr>
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Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting—Patient Knowledge and Beliefs	**Outer Setting—Other Patient Attributes**	**Others**
				patient copay amounts or in total societal costs (total overall healthcare costs + patient copay amounts + lost productivity from absenteeism + lost productivity from presenteeism) No significant difference between MBSR and UC, or between CBT and UC, in health care utilization (all office-based and outpatient care, ED visits, hospital inpatient stays, pharmacy prescriptions, imaging visits) or productivity losses (absenteeism lost hours, presenteeism lost hours)
ACT				
Casey, 2020[54] High Irish academic health system	11 adults who completed 8-week multidisciplinary program (group ACT + education + exercise), 1 arm in RCT vs exercise-only Chronic non-cancer pain condition diagnosed by a physician; pain >12 weeks; ≥2 on Brief Pain Inventory-Interference Scale (BPI-I)	*"A number of participants… referred to acceptance as an acknowledgment of the presence of pain, but with a firm belief that life could still be lived despite pain."* *"Some participants reported having different initial responses to the concept of pain acceptance. Many described a strong initial emotional reaction, involving anger and resistance upon hearing the word 'acceptance'…others showed no strong initial reaction and these*	"The importance of family emerged as a key value for the study participants, who were aware of the burden their pain had on family members…" *"The value of social interaction, achieved through re-engaging in valued activities emerged as significant for some participants… [P]articipants described an evolving awareness of self-care and a recognition of the need to*	**Intervention Characteristics —Group Dynamics:** "*Empathy and validation were highly valued by participants and this was primarily provided by other group members."* *"The provision of altered perspectives within the group appeared to facilitate the identification of values and subsequent values-based action for some individuals…"*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
	Semi-structured focus groups, thematic analysis	*participants appeared to have begun the acceptance process prior to the programme commencement.”* *“some…appeared to move from…initial position of anger and resistance to acceptance, towards…a realization that their lives had changed and they were now moving towards considering expanded possibilities… [D]evelopment of altered perspectives towards acceptance appeared to be associated with changes in both mindset and behaviours.”* *“Acceptance did not appear to be a specific destination that …[to be] reach[ed]. Instead it emerged as a complex dynamic process, and participants continued to move through the various stages for some time after the programme concluded…”* *“For 1 of the participants, acceptance was associated with giving up…She chose not to accept pain as she believed acceptance would prevent her from moving forward with her life.”* *“A fear of causing damage to themselves and associated negative*	*look after their own needs as well as those of family members.”* *“…[A]lthough they could identify their personal values, some participants did not appear ready to move towards values-based action. These individuals continued to avoid experiences that were perceived to involve pain or discomfort.”* *“Some participants identified work as a key value. One individual described how they valued the social interaction associated with working and they enjoyed their job despite the physical challenges.”*	

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting—Patient Knowledge and Beliefs	**Outer Setting—Other Patient Attributes**	**Others**
		imagery, seemed to limit the ability to engage in the acceptance process.” *“A belief that a specific diagnosis or cure may be offered also appeared to be a barrier to acceptance…In contrast, when participants acknowledged there was no specific cure for chronic pain, this facilitated acceptance.”* *“participants reported positive experiences… about mindfulness. Most participants understood the purpose of mindfulness to simply be in the present moment…While most participants found mindfulness to be of benefit, some appeared to struggle with the concept ‘I hated that whole mindfulness thing…’.”*		
Clarke, 2017[42] Moderate UK community health system and academic health system	7 adults in RCT of 6-week group ACT vs UC Knee or hip OA, radiologically confirmed; ≥5 on pain intensity numerical rating scale (NRS) and ≤75 on Chronic Pain Acceptance Questionnaire (CPAQ) Semi-structured interviews, thematic analysis	*“…range of skills and knowledge that participants acquired…that contributed to their perceptions of increased self-management of their condition”* *“Accepting limitations/committing to activities describe the participants’ development of a dual attitude towards their pain following participation in the group... combined an acceptance of the ongoing presence of pain and the limitations that it will cause, but at the same time*		**Intervention Characteristics—Group Dynamics:** *“…being able to express emotions freely in a nonjudgmental atmosphere, and feeling a sense of solidarity with other OA patients that were ‘in the same boat’… feeling emotionally supported by other group members, particularly in terms of having their difficulties validated by other group members.”*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting—Patient Knowledge and Beliefs	**Outer Setting—Other Patient Attributes**	**Others**
		committing to keeping as active and mobile as possible. All… mentioned this attitude as key to their self-management… acquired through participation in the group.” *“…realization that they needed to set…consistent goals…to keep themselves as active as possible… participants…noted the need to make these goals realistic and use pacing skills to achieve it…”* *“…development of the use of mindfulness strategies especially in…how to train their attention to become more attuned to the present moment…”* *“learning more about their pain and how pain-related to their [arthritis] condition… aspect of the intervention that used psycho-educational techniques to illustrate the neuropsychological processes behind pain expression. For many… the identification of psychological factors was helpful in giving them confidence to become more active and to decatastrophize the impact of pain on their thinking and mood”* *“…helping them develop a different perspective on their pain and*		*“…benefits…from sharing with 1 another the best ways of managing their condition… included both practical strategies of self-management… and specific pain [treatments]…”* *“…therapist’s role as group facilitator…therapist’s emotional attitude (relaxed, nonjudgmental and understanding) and…use of techniques and adaptations to help the group understand and apply concepts…”* *“group helped participants identify areas [in which] they were not coping and needed to develop. For some, the group presented a ‘wake-up call’ to help them challenge negative thinking patterns or identify ways they had become ‘stuck’.”*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
		disability…recognizing the importance of taking a biopsychosocial approach to self-management and encouraging a more positive perspective.”		
McCracken et al 2014[47] Moderate UK community health system	73 adults (GP practices in southwest England) in RCT of 4-session, 2-week group ACT vs UC; 24 adults in qualitative analyses Persistent pain ≥3 months; sought GP treatment for pain in past 6 months; ≥4 on pain interference with activities of daily living (0-10, modified disability subscale of CPG) Questionnaires, semi-structured interviews Quantitative methods NR; thematic content analysis	*“…not all informants had initially recognized that the aim was to manage or cope with pain, rather than to reduce the intensity or duration of pain…”* *“obstacles to sustained engagement and attendance. Principal among these… was the challenging and emotionally/ physically demanding nature of the group sessions”* *“Whereas many found the approach helpful and referred to the benefits they had gained from specific exercises and the overall experience, others were more equivocal, and some found the approach difficult to grasp…”* *“…described their experience…[as] a focus on creating openness to experiences of pain and on values: ‘It’s helped me…to consider that pain is…not necessarily something to stop you doing things, to view life in a different way so life can become more rewarding…”*	Participants who did not attend an adequate number (≥3) of ACT treatment sessions did not differ from those who did in terms of age, gender, ethnicity, marital status, mean years of education, employment status, number of medical comorbidities, primary pain location, pain duration, pain-related disability (RMDQ, subscale of CPG), average past-week pain intensity (NRS), pain acceptance (CPAQ), acceptance (AAQ-II), or quality of life (SF-36, EQ-5D-5L) *“…factors that motivated participation…Many had experienced other interventions that had not satisfactorily ameliorated their symptoms and were prepared to try anything that’s offered that might help.”* *“Some informants felt that demographic factors and age in particular influenced the extent to which participants understood or were receptive to the psychological orientation of the*	**Intervention Characteristics —Group Dynamics:** *“how the intervention had helped them, for example, by encouraging them to reframe their own difficulties by comparison with others in the group and in doing so acquire an increased motivation to cope…”* **Outer Setting --Patient Needs and Resources:** *“…several participants found the duration of the sessions and the mode of delivery difficult to cope with…”*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
		"…some informants found the sessions emotionally challenging or difficult to understand"	*intervention: '…for older people you need to talk their language… they've been through wars and what not… they just want someone to tell them either way.'"*	
MBSR				
Brintz, 2020[38] High US academic health system	22 adults who completed 4-week group MBSR pain program Chronic non-cancer pain condition; daily or almost daily pain ≥3 months; >3 on 0-10 scale of pain bothersomeness in past 7 days and/or >2 on 0-10 scale of pain interference with general activities in past 7 days; established with at least 1 medical provider for pain management Structured qualitative interviews, reflexive thematic analysis	*"…some expressed that the length of the course was not sufficient to fully build the skill of a regular mindfulness routine."* *"…some… [had] an expectation or desire for more focus on chronic pain than was included in the curriculum… 'I thought it would be more focused on how to control the pain, less on exercises and breathing, [and more on] how to get off medication.'… Some participants felt that the curriculum did not focus directly on chronic pain as much as they were hoping."* *"Three participants wanted more physical movement in the course… content that had been removed… to condense the standard MBSR course content. 'I know a lot of people are in pain in different ways, but if we had been more focused on moving around, we wouldn't have been thinking on the pain as much. . .. I think if we had more movement it would have been better.'…These*		**Intervention Characteristics —Design Quality and Packaging** *"…several participants expressed their appreciation for the additional resources, such as recordings and handouts, provided by the instructors to support their practice outside of class… 'I expected I would set out these times I would do my practice, and it just didn't happen like that, so having a mobile set of tools helped me go with the flow about it.'…These mobile tools allowed participants to fit their mindfulness practice into their lives."* **—Group Dynamics:** *"Many participants appreciated the social support they received from group participation, …input…from group members helped them to feel less isolated in their pain experience."*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
		participants felt that some type of physical movement would have added value to their experience and helped the time pass more quickly.” *“Some participants suggested that the sessions be offered multiple days per week to reinforce the material. Others suggested including more information on anxiety, pain, and the mind–body connection.”*		*“…sharing with other group members helped them to feel better about what they were struggling with while learning mindfulness.”* *“…some felt that there was insufficient group bonding…[They] felt that if the class had been longer, there would have been more of an opportunity to bond as a group…four meetings…not enough for group cohesion.”* *“… some participants expressed that they would have preferred a one-on-one format for the course… they found the group detracted from their experience.”* **Outer Setting—Patient Needs and Resources:** *“…getting to the sessions was an ordeal, with their pain making session attendance difficult... four participants related barriers to attendance of…meetings, with two participants noting schedule difficulties related to caregiving commitments…*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting—Patient Knowledge and Beliefs	**Outer Setting—Other Patient Attributes**	**Others**
				[Most] participants did not have difficulty attending sessions… the shortened format added benefit for fitting the course into their schedules.” *“Over half (59%) of participants stated that they would have preferred more than four sessions, with the remaining 41% stating that four was just right. The majority of participants (73%) stated that the session length of 90 minutes was just right, with only 9% of participants preferring shorter sessions.”*
Crisp, 2016[44] Low US military health system	6 adult women in military who completed 6-week group MBSR pain program Chronic pelvic pain diagnosis Focus group, unclear analysis method			**Intervention Characteristics—Design Quality and Packaging:** *“All participants felt that weekly messages encouraged mindfulness… Being able to access an audio recording of training sessions to review at an alternate time was deemed helpful by all participants…”* **Outer Setting—Patient Needs and Resources:** *“Half of the participants felt an online program would be beneficial, the other half*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting—Patient Knowledge and Beliefs	**Outer Setting—Other Patient Attributes**	**Others**
				preferred in-person sessions to foster program engagement.” *“[Of those] who left the program due to time commitment, 2 were highly involved in sexual advocate responsibilities and were shuffling work commitment, single motherhood, and time commitment to the study… [Participants] were pleased with the number and timing of sessions though felt the time commitment was significant…”*
George, 2017[43] Moderate US academic health system	32 HIV+ adults in randomized pilot study of 8-week group MBSR pain program vs EOC; 10 in baseline focus group, unclear number in post-interventions groups; Neuropathic and/or musculoskeletal pain ≥ 3 months Questionnaires; focus groups Descriptive statistics, correlations, ANOVA; thematic analysis	*“…participants were generally open to [mind-body treatments]”* *“1) MBSR techniques are useful for relaxation and relieving pain; and 2) practice of MBSR techniques has benefit that extends beyond the practice time...”*	Higher baseline pain interference (BPI-Interference) was correlated with less-frequent session attendance (r -0.357, p=0.045). Attendance was not associated with participant demographic factors (age, gender, ethnicity, whether or not they lived alone) or with whether or not participants had a pre-existing relationship with the research team	**Intervention—Group Dynamics:** *“Participants from both groups valued the opportunity to come together and connect with people with similar experiences.”* *“…there should be more time for conversation… ‘We had a chance to not just hear what everybody has to say, but to talk to each other. And we were being curtailed from doing that.’”* **Outer Setting—Patient Needs and Resources:**

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
				"…there should be less sitting still, which tended to exacerbate pain…"
Martinez, 2015[56] Moderate US, VHA	48 Veterans referred to group MBSR at 1 facility (n=21 declined, n=21 completed treatment, n=6 dropped out); EHR diagnoses from VHA data—37 with chronic pain, 32 with history of depression, 25 with PTSD Semi-structured interviews, "simultaneous inductive and deductive content analysis"	*"Insufficient or inaccurate information [about MBSR] also surfaced as a barrier…especially if it led [them] to believe that the program would not be valuable… 1 decliner was under the impression from her provider that MBSR was for people whose problems were in their head"* *"…[M]ore complex barriers… [included] difficulty understanding the purpose of MBSR practices… 'I felt ignorant and embarrassed so that's why I quit.'"* "*Some veterans with pain found practicing the body scan to be difficult. To increase awareness of their bodily sensations and 'focus on my pain' was a challenging concept: 'We're supposed to resist the pain. You know, that's what we're taught: resist the pain, not to approach and accept it.' Another veteran explained, 'There were body parts of mine that hurt, that I didn't recognize hurt until I did the body scan, and I went [sigh], well that sucks, you know, realizing that my toes aren't just numb, but there's more of a pain also.' Even knowing that it is 'something you're*	*"…Referring providers expressed concern that MBSR would not be a good fit for veterans with strong religious beliefs… However, many participants reported that this was not an issue and… most did not perceive a relationship between MBSR and their religion/ spirituality at all."*	**Intervention Characteristics — Design Quality and Packaging:** *"wanted MBSR to be held in a space that is quiet, not 'too crowded,' and consistent"* **—Group Dynamics:** *"Negative reactions to the instructor or other group members also led to discontinuation… frustration with class time spent discussing topics that they viewed as irrelevant: 'I quit because there are three gentlemen in there who…have nothing better to do and want to talk about Vietnam. I'm not there to get over the military, I'm over there to get over my back pain.'"* *"Some first-time participants found the presence of re-enrollees problematic…"* *"…[M]ixed-gender [groups]… was difficult for some women with histories of sexual assault…"*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
		supposed to learn to deal with and you know, accept, and go on with,' many patients preferred to 'ignore it and not pay attention if it's there, if I can help it.'" *"Some were afraid that they were 'just going to end up hurting real bad,' even if they believed that 'can't be the reason [the teachers] want us to do it.'"*		*"…[Veterans with] experiences from varying periods of service… was challenging for some participants when it affected the focus of group discussion…"* *"Many patients were able to minimize pain and accommodate their disabilities by making adjustments to the standard practices [of seated meditation]… Sometimes, the MBSR teacher aided in this process…other times 'the instructors need to be a little bit more open-minded… some of us have to stretch a certain way or move a certain way.''* *"Participants were discouraged by groups that felt unstructured or lacked adequate control by the instructor, which prompted a dropout at least once. Conversely, they seemed to respond well to teachers who were able to take a group of 'hard core veterans' 'through each and every step of the program'… [T]eachers' lack of*

Author, Year; Quality; Setting	Participants; Chronic pain definitions; Data sources and analyses	Outcomes by CFIR Domain		
		Outer Setting— Patient Knowledge and Beliefs	Outer Setting— Other Patient Attributes	Others
				military service…[and] [u]nfamiliarity with veteran culture was perceived as leading to reluctance…to provide limits and accountability during group discussion…” **Outer Setting—Patient Needs and Resources:** *“Meditating for long periods of time… was challenging enough for some to say ‘‘the class wasn’t meant for a person going through all the pain I was going through.’’ However, they were still ‘‘able to put the pain aside and gather something even though I was in a great deal of pain.’’ In fact, participating in the practices despite the discomfort ‘‘makes me feel a little better because it’s saying I can do stuff even though I’m still in all this pain.’’* *“When dropouts were asked why they did not complete MBSR, many cited logistical reasons, such as scheduling conflicts (eg, full-time employment), insufficient practice time, or that*

Author, Year; Quality; Setting	**Participants; Chronic pain definitions; Data sources and analyses**	**Outcomes by CFIR Domain**		
		Outer Setting— Patient Knowledge and Beliefs	**Outer Setting— Other Patient Attributes**	**Others**
				attendance was inhibited by medical/surgical problems affecting mobility… Many patients were able to minimize pain and accommodate their disabilities by making adjustments to the standard practices…In other cases, however, veterans did not feel supported when they tried to make these adjustments…"

Abbreviations. AAQ-II=Acceptance Action Questionnaire; ACR=American College of Rheumatology; ACT=Acceptance and Commitment Therapy; AIMS2-SF=Arthritis Impact Measurement Scales Version 2 Short Form Revised; BDI=Beck Depression Inventory; BDI-II=Beck Depression Inventory-Second Edition; BPI=Brief Pain Inventory; CB=cognitive behavioral; CBT=Cognitive Behavioral Therapy; CBT-CP=Cognitive Behavioral Therapy for Chronic Pain; CBT-PI=Cognitive Behavioral Therapy for Pain and Insomnia; CESD=Center of Epidemiological Studies Depression Scale; CFIR=Consolidated Framework for Implementation Research; CPAQ=Chronic Pain Acceptance Questionnaire; CPG=Chronic Pain Grade; CPGQ=Chronic Pain Grade Questionnaire; CSQ=Client Satisfaction Questionnaire; CWP=chronic widespread pain; DBAS=Dysfunctional Beliefs and Attitudes About Sleep; EHR=Electronic health record; EOC=education-only control; EQ-5D-5L=EuroQol measure of quality of life; FFS=Flinders Fatigue Scale; GCPS=Graded Chronic Pain Scale; GDS=Geriatric Depression Scale; GP=General practitioner, term commonly used in UK; GPR=Global Pain Rating; HIV=Human Immunodeficiency Virus; ISI=Insomnia Severity Index; MBSR=Mindfulness-Based Stress Reduction; NR=not reported; NRS=Numeric Rating Scale; OTC=over the counter, referring to medications bought directly by patients rather than prescribed by a health care provider; PBCL=Pain Behavior Check List; PCP=Primary care provider, term commonly used in US; PCS=Pain Catastrophizing Scale; PHQ-9=Patient Health Questionnaire–9; PMP=pain management program; PRI=Pain Rating Index, from McGill Pain Questionnaire; PRIME CBT=Primary Care Based Cognitive Behavioral Therapy; PSOCQ=Pain Stages of Change Questionnaire; PSQI=Pittsburgh Sleep Quality Index; QALY=quality-adjusted life year; QOL=Quality of life; RCT=randomized controlled trial; RMDQ=Roland-Morris Disability Questionnaire, 24 items; RMDS=Roland-Morris Disability Scale-11, 11 items; SF-36=Short Form Health Survey; SOPA=Survey of Pain Attitudes; T-CBT=telephone cognitive behavioral therapy; TSK=Tampa Scale for Kinesiophobia; UC=usual care; UK=United Kingdom; US=United States of America; VA=Veterans Affairs; VHA=Veterans Health Administration; WHOQOL=World Health Organization Quality of Life; WHYMPI=West Haven–Yale Multidimensional Pain Inventory; WRAT=Wide Range Achievement Test-4.

Appendix Table G2. KQ2 Articles Examining Facilitators and Barriers to Implementation for CBT and CBSST for Chronic Mental Health Conditions

Author, Year; Quality; Setting	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	**Outer Setting**	**Inner Setting**	**Characteristics of Individuals**
CBT for Insomnia, SUD, and OCD					
Amodeo, 2011[97] **Low** **US community clinics**	27 staff implementing CBT at addiction treatment programs funded by CSAT/ SAMHSA Semi-structured interviews Content analysis		**Patient Needs:** • Among 10 most frequently reported barriers for CBT—attendance is poor, transportation, cultural/language barriers **Patient Other Attributes:** • Among 10 most frequently reported barriers for CBT—client resistance, cognitive barriers to understanding CBT concepts, anti-social personality disorder, groups often resist session content	**Readiness for Implementation—Available Resources:** • Among 10 most frequently reported barriers for CBT— not enough time to complete treatment, staff not trained well enough	**Knowledge & beliefs:** • Among 10 most frequently reported barriers for CBT—not enough well educated, qualified staff in our geographic area
Koffel, 2020a[57] **High** **US (VHA)**	29 patients with insomnia Focus groups Thematic analysis	**Adaptability:** *"…several patients indicated that they would place a workbook by their bed for quick reference, use electronic applications…when traveling, and use web-based CBT-I on their computer or tablet at home."*	**Patient Other Attributes:** *"…general sense of hesitancy to immediately commit to provider-delivered CBTI…the exception was patients who had a positive history with mental health treatments."*	**Readiness for Implementation—Available Resources:** *"'[Primary Care providers] are in such a hurry to get you out the door that they don't ask about sleep.'"* **Patient-Provider Relationships:** *"…more willing to engage if 1) a known primary care provider facilitated an introduction or 2) the CBT-I provider reached out to them."*	**Knowledge & Beliefs:** *"Several patients pointed out that providers need to be informed about CBT-I to answer patient questions and facilitate referrals."*

Author, Year; Quality; Setting	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	**Outer Setting**	**Inner Setting**	**Characteristics of Individuals**
Koffel, 2020b[59] **High** **US (VHA)**	17 providers (5 facilities)—8 PCPs, 4 psychologists, 5 CBT-I coordinators Semi-structured interviews Thematic analysis	**Adaptability:** *"...providers appreciated the potential scalability and convenience of CBT-I for primary care settings…"*		**Networks & Communications**: *"Strong connections between primary care clinics, PCMHI teams, and sleep medicine clinics increased utilization of CBT-I."* **Implementation Climate—Relative Priority:** *"The general consensus among physicians was that sleep took a 'backseat priority' in complex patients and was not prioritized by patients or providers."* **Readiness for Implementation —Leadership Engagement:** *"…two key facilitators that… contributed to a successful implementation and widespread dissemination of CBT-I: local champions and leadership support."* **—Available Resources:** *"Most primary care physicians were satisfied with CBT-I resources in their facility."* **—Access to Knowledge & Info:** *"Several primary care physicians expressed the desire for a more centralized resource to learn about CBT-I and make referrals…"*	**Knowledge & Beliefs:** *"I have been educated in research talks from an expert in the area. I've forgotten the specifics of studies that show effectiveness, but I believe it is effective based on what I have heard."* *"…psychologist suggested integrating CBT-I education into resident lectures about general primary care problems, like pain, anxiety, and depression to increase the use of CBT-I as a first-line treatment."*

Author, Year; Quality; Setting	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	**Outer Setting**	**Inner Setting**	**Characteristics of Individuals**
				Provider Decision-Making: *"…I like sending them out to PCMHI because I secretly hope they will address some of their underlying mental health issues…"*	
Kyrios, 2010[98] **Low** **Australian clinics**	9 general practice providers, 10 psychologists Interviews, focus groups Content analysis			**Readiness for Implementation—Available Resources; Access to Knowledge & Information:** *"GPs reported that they needed greater basic knowledge about OCD. They requested psycho-educational information in relation to screening for and assessing the severity of OCD symptoms; they also requested treatment guidelines and some training in CBT strategies."*	**Knowledge & Beliefs:** *"Psychologists reported themselves as knowledgeable about OCD…also stressed importance of GP support in ongoing care and management of people with OCD…"*
Ulmer, 2017[64] **Moderate** **US (VHA)**	51 PCPs Surveys, response rate 13% Descriptive statistics			**Readiness for Implementation—Available Resources:** • Satisfaction regarding opportunities for training is assessment and diagnosis of sleep disorders (Likert 1-10, 10=very satisfied), most common response was 5 (33%)	**Knowledge & Beliefs:** • 82% had some familiarity with CBT-I • Perceived available sleep treatments included referral to sleep specialist within VHA facility (53%) and referral to CBT-I (29%)
CBSST for Severe Mental Illness					
Sommer-feld, 2019[99] **Moderate**	8 clients of assertive community treatment, 54 treatment	**Adaptability, Complexity:** • Provider's ability to apply CBSST flexibly	**External Policy:** • External rules, guidelines and resources—data systems to measure and report meaningful CBSST	**Networks & Communications:** • Providers having tools to track/monitor client progress • Seeing other providers' success delivering CBSST	**Knowledge & Beliefs:** • Provider beliefs about whether CBSST improves client outcomes, client progress in setting or

Author, Year; Quality; Setting	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	**Outer Setting**	**Inner Setting**	**Characteristics of Individuals**
US local behavioral health agencies	providers, 11 leaders of treatment teams, 5 agency administrators, 5 public sector administrators, 4 trainers Focus groups Concept mapping	• Having sufficient time in visits to go as 'deep' as needed for CBSST	outcomes, available funding to deliver CBSST, recognition of CBSST as an effective treatment approach • Funding source willingness to adjust requirements regarding productivity, case-load, and time-frames **Patient Beliefs & Knowledge:** • Relevance of CBSST concepts/ideas to clients • Client motivation/buy-in to do CBSST **Other Patient Attributes:** • Openness of clients to structured materials (*eg*, workbooks, homework)	• Systems/processes to communicate client CBSST information among providers **Implementation Climate—Compatibility:** • Flexibility to adapt CBSST while maintaining fidelity, • CBSST structure/content makes visits feel more purposeful • Creation of shared expectations for both clients and providers • Compatibility of CBSST with other EBPs, **Readiness for Implementation—Leadership Engagement:** • Communication about CBSST importance from team supervisors/leads • Prioritization level of CBSST by agency • Agency leadership buy-in of/support for CBSST **—Available Resources:** • Understaffed/overworked teams • Additional administrative demands (*eg*, documentation) needed to deliver CBSST • Impact on provider productivity requirements	accomplishing goals due to CBSST • Provider perception of usefulness/relevance of CBSST skills to other interventions • Perceived burden of delivering CBSST • Receiving positive feedback from clients **Self-efficacy:** • Provider confidence delivering CBSST **Other Attributes:** • Provider openness to try new things • Provider enthusiasm for CBSST

Author, Year; Quality; Setting	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	**Outer Setting**	**Inner Setting**	**Characteristics of Individuals**
				• Access to CBSST information and training • Time allotted for practice and feedback during training, supervision for providers	

Abbreviations. CBT=Cognitive Behavioral Therapy; CBT-I= Cognitive Behavioral Therapy for Insomnia; CQR= Consensual Qualitative Research; CSAT/SAMHSA=Center for Substance Abuse Treatment/Substance Abuse and Mental Health Services Administration; DBT=Dialectical Behavioral Therapy; EBP=Evidence-Based Psychotherapies; GP=General Practitioner; MBSR=Mindfulness-Based Stress Reduction; OCD=Obsessive-Compulsive Disorder; PARIS=Promoting Action on Research Implementation in Health Services; PCMHI=Primary Care Mental Health Integration; PCP=Primary Care Provider; PE=Prolonged Exposure Therapy; PTSD=Posttraumatic Stress Disorder; CBSST=Cognitive Behavioral Social Skills Training; SUD=Substance Use Disorder; VHA=Veterans Health Administration

Appendix Table G3. KQ2 Articles Evaluating Implementation Strategies for CBT, ACT, DBT, MET, and Contingency Management

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
CBT for Pain, Depression, Anxiety, Insomnia, and PTSD						
Clark, 2009[94] **Low** **UK**	Patients at a primary care clinic, most referred for in-person CBT for depression or anxiety Patient symptoms and referrals Paired t-tests comparing initial assessment vs post treatment outcomes	• 24% of the patients referred (249 of 1043) attended ≥ 2 sessions • 22% black individuals among self-referrals (total n=203) vs 16% of those referred by GPs (total n= 688), p= 0.04	• Mean PHQ-9 scores at initial assessment were 15.3 (SD=6.2) vs mean 8.2 (SD=7.2) at last available session, Cohen's d=1.06, p<0.001 • Mean GAD-7 scores at initial assessment 13.7 (SD=5.1) vs mean 6.8 (SD=5.8) at last available session, Cohen's d=1.26, p<0.001			
Cully, 2010[88] **Moderate** **Kauth, 2010**[89] **High** **US (VHA)**	28 providers trained in CBT for depression (20 clinics), 12 received external facilitation (10 clinics) and 11 did not (10 clinics), all within the South Central Veterans Integrated Service Network Pre- and post-workshop surveys, and 3			• Non-significant differences between groups in change in CBT use from baseline to 3 months post-training (p=0.22): – Facilitated providers—mean 19% of patients treated with CBT at baseline, 38% at follow-up – Non-facilitated providers—mean 32% of patients	• $2,489 personnel costs of CBT training: – 25 hours of facilitator time ($1,445) – 26.5 hours of provider time ($1,014) – Gained 332 more hours of CBT delivered over 7 months • Barriers to using CBT:	

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
	months post-consultation survey; interviews; and study logs χ^2 and nonparametric Wilcoxon signed rank tests, ANOVA; qualitative analytic methods NR			treated with CBT at baseline, 35% at follow-up • Provider characteristics not associated with change in CBT use—location (medical center vs community clinic), professional background (psychologist vs social worker vs nurse), and prior CBT training • Non-significant differences between groups in change in CBT knowledge and ability from baseline to 3 months post-training • Increase in use of specific CBT procedures from baseline to 3 months post-training (Likert 1-5, 1=never, 5= always) [Cully]: orienting patients to CBT (p=0.003), setting goals (p = 0.002), and behavioral activation (p = 0.01) • Increase in CBT knowledge from baseline to 3 months post-training (Likert 1-	– Lack of control over schedule – Provider rejection of CBT due to difficulty and inflexibility; – Therapist duties – Poor communication between therapists and leadership	

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
				5, 1=poor, 5= excellent) ($p < 0.01$), but not in CBT ability ($p = 0.07$)		
Curran, 2015[81] **High** **US (VHA)**	8 counselors (7 SUD clinics) who completed online training in CBT for depression Semi-structured interviews Template approach & interpretive analysis	*"….a lot of the clients we have come in with different traumas, different losses that they have experienced, and… CBT… might not help them enough…"*			*"I'm going to have to do the group* [alone]*…I don't think I'm going to have a co-facilitator…"* *"…we may just admit them on an open basis which is not ideal with the curriculum, but…I'm not too worried. I am comfortable enough … that I can adapt on the fly."*	
Hepner, 2011[90] **Moderate** **US community clinics**	5 addiction counsellors in Los Angeles County who were trained in group CBT for depression, and 113 patients who attended ≥1 CBT session and responded; Surveys (86% response rate) and ratings of audio-recorded sessions (N=80); Random effects ANOVA for	- Most patients thought groups helpful: – 86% could use information from group in daily life – 83% agreed exercises conducted in group were helpful – 86% found group leaders helpful – 77% agreed group was helpful in improving mood			- Mean provider adherence rate was 94%, 84% of coded sessions had adherence rates > 85% - Mean provider competence score was 4.1 (≥ 4.0 indicated competence) - Adherence and competence did not vary by treatment module ($p=0.3$ and $p=0.2$)	

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
	differences by treatment module	– 77% could understand presented information				
Karlin, 2012[93] **Moderate** **US (VHA)**	221 providers in national training program for CBT for depression (82% completed training), and 356 patients who received CBT from trainees during consultation phase Surveys pre- and post-workshop, and post-consultation 79%-95%), and 3-12 months after full training (response rates; competency ratings on audio-recorded patient sessions; patient reported outcomes (source NR) t-tests, ITT analyses examining patient		• Comparing initial to later sessions (#10 or after), BDI-II scores decreased: – Mean 28.1 initially, 16.9 later (p<0.001) – Using LOCF, mean 28.2 initially, 19.6 later (Cohen's d=0.80, p<0.001) • For 181 patients who completed ≥10 sessions and completed WHOQOL-BREF, scores in all domains increased: – Psychological Cohen's d = 0.74 (p <0.001) – Physical Cohen's d = 0.48 (p <0.001) – Social: Cohen's d = 0.44 (p <0.001) – Environmental Cohen's d = 0.39 (p <0.001)	• CBT-specific self-efficacy mean scores: – pre-workshop 3.7 (SD 0.9) – post-workshop 4.0 (SD 0.7) – post-consultation 4.8 (SD 0.7) – p<0.001 both comparisons – 7-item scale, Likert responses (1-5, disagree to strongly agree) • General psychotherapy self-efficacy mean scores: – pre-workshop scores NR (noted as not different from post) – post-workshop 4.5 (SD 0.6) – post-consultation 5.1 (SD 0.6) – p<0.001 comparing post-workshop to post-consultation – 8-item scale, Likert responses (1-5, disagree to strongly agree)	• Of 167 providers with competency ratings data both initially and later during training, mean scores increased from 38.2 (SD 8.6) to 45.0 (SD 6.9), p<0.001 • 87% of providers had competency scores ≥ 40 later in training (41% did initially)	• 3-12 months post-training, providers used CBT with on average, 47% of patients (with depression), average was 19 total patients with depression treated per provider since completion of training, (range 0-140) • 3-12 months post-training, providers reported they were likely to recommend CBT to patients with depression

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
	outcomes (mixed effects models, also used LOCF for missing data)			• CBT attitudes mean scores: – pre-workshop 3.9 (SD 0.5) – post-workshop 4.1 (SD 0.4) – post-consultation 4.2 (SD 0.5) – $p<0.001$ both comparisons – 15 items, response options NR		
Karlin, 2013[85] **Moderate** **Manber, 2013**[92] **Moderate** **US (VHA)**	207 providers trained in national program for CBT-I (193 completed the program), and 182 patients with insomnia who received ≥ 1 CBT-I session from trainees Surveys (response rate 89% for 6 months follow-up) and competency ratings of audio-recorded sessions; t-tests, mixed effects models examining changes in		• ISI scores (n=115 patients who completed treatment) decreased from mean 20.5 (SD 4.4) at baseline to 11.0 (SD 6.9) after ($p<0.001$), 60% had moderate improvement (≥ 8 points decrease), and 53% had ISI score <11 after treatment (cutoff for insomnia diagnosis) • BDI-II scores (n=115) decreased from mean of 23.8 (SD=11.3) at baseline to 17.1 (SD=12.3) at last session, Cohen's d= 0.60 ($p<0.001$) • WHOQOL-BREF scores (n=104-112)	• CBT-I-specific self-efficacy mean scores: – pre-workshop 3.6 (SD 1.1) – post-workshop 4.3 (SD 0.7) – post-consultation 5.1 (SD 0.7) – $p<0.001$ both comparisons – Likert responses (1-6, Not at all confident to completely confident) • General psychotherapy self-efficacy mean scores: – pre-workshop scores NR (noted as not different from post) – post-workshop 4.9 (SD 0.6)	• 401 taped sessions (99 providers) were reviewed for competency, item scores 0-4 (poor to excellent) • Mean competency scores 4.9 points higher comparing first with sixth session for first patients ($p<0001$), and 2.9 points higher comparing first with second patients ($p<0.001$)	• At 6 months post-training, 74% providers were using CBT-I, mean of 3.4 patients treated with CBT-I per provider in past month (range 0-52) • Common challenges to ongoing use of CBT-I: – competing professional demands (35 providers) – patient issues like no-shows and patients' distance form clinic (14 providers)

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
	competency scores and patient symptoms		decreased across all domains: – Psychological Cohen's d = 0.60 (p <0.001) – Physical Cohen's d = 0.87 (p <0.001) – Social: Cohen's d = 0.40 (p <0.001) – Environmental Cohen's d = 0.34 (p <0.001)	– post-consultation 5.3 (SD 0.5) – p<0.001 comparing post-workshop to post-consultation – Likert responses (1-6, Not at all confident to completely confident) • CBT attitudes mean scores: – pre-workshop 4.0 (SD 0.5) – post-workshop 4.4 (SD 0.5) – post-consultation scores NR (noted as not different) – p<0.001 comparing pre- to post-workshop – 6 items, Likert responses (1-5, strongly disagree to strongly agree)		
Mignogna, 2014[86] **Moderate** **US (VHA)**	9 PCMHI providers (2 sites) who received online training in CBT for anxiety and depression (4 completed all modules), with audit and			• 5 providers agreed to accept 1-2 patient per month, as part of study	• Ratings of patient sessions (Likert scale 0-8 on adherence and skill, 6 = good and 8 = very good/excellent), mean adherence 6.7, (SD 0.98) and skill 6.2 (SD 0.84)	

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
	feedback and facilitation Surveys and ratings of audio-recorded sessions Descriptive statistics					
Ruzek, 2014a[83] **Moderate** **US (VHA)**	139 mental health providers randomized to CBT training as usual (n=51), internet training modules only (n=46), and internet training with telephone consultation (n=42) Surveys and provider skills rated on standardized patient encounters, pre- and post-training ANCOVA comparing post-training scores			• Changes in mean CBT knowledge test scores (range 0-12) pre- to post-training—no training 0.26; internet only 1.26; internet with consultation 1.72 (p<0.001, either training arm vs control) • Changes in mean self-efficacy (Likert 1-10) pre- to post-training—no training 0.21; internet only 1.08; internet with consultation 1.28 (p<0.001, either training arm vs control) • Changes in mean self-reported frequency of using skills (Likert 1-5) pre- to post-training—no training 0.20; internet only 0.37; internet with consultation 0.23 (p-value NR)	• Changes in mean skills ratings pre- to post-training on standardized patient encounters: – Motivation enhancement—no training -0.01; internet only 0.12; internet with consultation 0.35 (p<0.001, either training arm vs control) – Goal setting—no training 0.10; internet only 0.04; internet with consultation 0.18 (p-value NR) – Behavioral task assessment—no training -0.02; internet only 0.17; internet with consultation 0.27 (p<0.001, either	

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
					training arm vs control)	
Stewart, 2015[24] **Moderate** **US (VHA)**	71 providers trained in national program for CBT-CP (60 completed training), and 148 patients with chronic pain who received CBT-CP from trainees Surveys 6 months post-training (response rate 80%), competency ratings of audio-recorded sessions, and patient reported symptoms t-tests for differences in provider competency, ITT mixed effects models examining patient outcomes		• Pain Catastrophizing Scale scores decreased from mean of 31.2 (SD 11.2) at initial session to 22.0 (SD 14.9) at final session, Cohen's d= 0.81, p<0.001 • Pain NRS decreased from mean 8.5 (SD 1.3) to 8.1 (SD 1.7), Cohen's d = 0.26, p<0.01 • Multidimensional Pain Inventory-Interference Scale scores decreased from mean of 4.7 (SD 0.8) to 4.2 (SD 1.1), Cohen's d = 0.57, p<0.001 • BDI-II scores decreased from mean 27.4 (SD 11.5) to 21.3 (SD 10.9), Cohen's d =0.53, p<0.001 • WHOQOL-BREF scores increased for all domains: – Psychological Cohen's d = 0.36 (p <0.001)		• On 485 recorded sessions (51 providers, mean 9.5 sessions per provider), competency ratings increased: – First patients mean of 3.3 (SD 0.5) to second patients mean 3.5 (SD 0.4), p=0.003 – Sessions 2-6 mean of 3.5 (SD 0.5) to sessions 7-10 mean 3.6 (SD 0.5), p<0.001	• 6 months post-training, mean of 13.8 (SD 13.3) patients treated with CBT-CP per provider, mean 66% of patients with chronic pain being treated with CBT-CP per provider • Mean 74% of new patients with chronic pain with whom outcome measures were used, per provider • Providers were confident with CBT-CP protocol, thought CBT-CP was effective, and were likely to recommend it to patients

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
			– Physical Cohen's d = 0.45 (p <0.001) – Social: Cohen's d = 0.30 (p = 0.003) – Environmental Cohen's d = 0.22 (p =0.005)			
ACT for Depression						
Walser, 2013[84] **High** **US (VHA)**	391 providers trained in national program for ACT (334 completed training), and 745 patients who received ACT from trainees Surveys pre- and post-workshop, post-consultation, and 3-12 months post-training (response rates 49-83%), and patient reported outcomes t-tests, mixed effects models examining changes in competency and symptoms		• BDI-II scores mean of 30.5 (SD NR) at baseline and 19.4 (SD 5.6) at final assessment, p<0.001, Cohen's d NR • For patients who had ≥10 sessions (n=417), WHOQOL-BREF scores increased for all domains: – Psychological Cohen's d = 0.61 (p <0.001) – Physical Cohen's d = 0.46 (p <0.001) – Social Cohen's d = 0.45 (p <0.001) – Environmental Cohen's d = 0.40 (p <0.001)	• ACT-specific self-efficacy mean scores: – pre-workshop 3.1 (SD 1.0) – post-workshop 3.8 (SD 0.7) – post-consultation 4.6 (SD 0.7) – p<0.001 both comparisons – Likert responses (1-6, Not at all confident to completely confident) • General psychotherapy self-efficacy mean scores: – pre-workshop 4.8 (SD 0.7) – post-workshop 4.7 (SD 0.7) – post-consultation 5.1 (SD 0.6)	• Proportion of providers who met ACT competency threshold (≥90 on ratings) were 21% in early, 68% in middle, and 96% in late consultation phase	• At 3-12 months post-training, providers using ACT with mean 39% of patients with depression • 48% providers agreed that ACT is effective for treating depression

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
				– p<0.001 comparing post-workshop to post- – Likert responses (1-6, Not at all confident to completely confident) • ACT attitudes mean scores: – pre-workshop 3.8 (SD 0.5) – post-workshop 4.1 (SD 0.5) – post-consultation 4.2 (SD 0.6) – p<0.001 comparing pre- to post-workshop – 6 items, Likert responses (1-5, strongly disagree to agree)		
DBT, MET, and Contingency Management						
DePhilippis, 2018[100] **Low** **VHA**	94 VHA SUD clinics implementing contingency management, 74% of sites participated in ≥5 coaching calls over ≥12 months, mean 22 patients	• 2,039 patients attended 56% of 49,104 possible sessions • By site, mean 56% of sessions attended (IQR 43-68%)	• 92% of patient urine samples (25,593 of 27,850) tested negative (mean 296.3 samples per site, median 187, range = 3–1684).	.	• 74% of clinics (n=70) integrated standard program (12 weeks of twice weekly sessions targeting stimulants with an 8-draw cap) • Indices of fidelity: – 96% related prizes to abstinence	• Mean 40.6 months that programs were operational (SD = 13.4, median 46.1, range 0.8–54.8).

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes Reach	Effectiveness	Adoption	Implementation	Maintenance
	per site (range 1-136) Attendance records, clinic processes, and patient lab results (data collected over 55 months) Descriptive statistics				– 81% asked about desired prizes – 67% distributed reminder slips – 54% test results immediately available	
Drapkin, 2016[79] **High** **VHA**	264 staff in VHA SUD clinics participating in MET training initiative, 81% (n=213) completed all training requirements Surveys ANOVA examining MET knowledge, skills, and use			• MET knowledge increased pre-training to post-workshop and post- consultation, p <0.001 for change over time • MET skills improved pre-training to post-workshop and post-consultation, p <0.001 for change over time • 95% of survey respondents (total n = 221) used MET outside of training context, 53% routinely using MET – 73% using with new patients,43% with consults, 47% for transitions, 84% with those ambivalent to treatments, and		

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
				53% as an adjunct to continuing care		
Kauth, 2017[96] **Moderate** **VHA**	44 mental health providers at 10 VHA medical centers who initiated web-based DBT training, 93% (n = 41) completed training and 74% attended every facilitation call Surveys Descriptive statistics			• 6 weeks post-training, 22 of 26 survey respondents reported conducting a DBT skills group	• 73% providers (73%) had difficulty completing online training during working hours • Total personnel hours = 1,298 – 19 hours for facilitation experts – 90 hours for 2 facilitators – 1,189 hours for providers (mean 29 hours each) • Non-personnel costs = $17,894 – $16,928 for access to web-based modules – $966 for copies of the training book	• 5 months post-training, 33 of 41 survey respondents reported conducting a DBT group
Landes, 2017[95] **Low** **VHA**	Providers and administrators involved in DBT implementation at 8 high- and 8 low-performing sites involved in VHA learning collaborative Semi-structured interviews				*"… [A]n example of logistical change… was to change a clinician's job expectations to provide flexibility …to do the work needed to get a program up and running… [A]n example of making a structural change was to create a DBT program that cut across clinics… [A]n*	

Author, Year; Quality; Setting;	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
	Codes derived from PARIHS framework, results grouped topically				*example of making a local policy change was to change the rules about clinicians calling patients outside of business hours … which is generally against VA policy.”* *“ ‘…* [mental health chief] *just gave her the flexibility to really take the time to do a lot of this other work, … knowing we may take a temporary hit for…individual therapy slots. But he was willing to see the big picture and knew this was an important thing for the veterans to have...”*	

Abbreviations. ACT=Acceptance and Commitment Therapy; ANCOVA=Analysis of covariance; ANOVA=Analysis of variance; BDI-II= Beck Depression Inventory-II; CBT=Cognitive Behavioral Therapy; CP=chronic pain; DBT=Dialectical Behavior Therapy; GAD-7= General Anxiety Disorder-7 scale; IQR=Interquartile range; ISI=Insomnia Severity Index; ITT=Intent to treat; LOCF=Last observation carried forward; MET=Motivational Enhancement Therapy; NRS=Numeric Rating Scale; PARHIS=Promoting Action on Research Implementation in Health Services; PCMHI=Primary Care Mental Health Integration; PHQ-9=Patient Health Questionnaire 9-item; SD=Standard deviation; WHOQOL-BREF= World Health Organization Quality of Life brief scale

Appendix Table G4. KQ2 Articles Evaluating Implementation Strategies for Trauma-focused Psychotherapies for PTSD (CPT and PE)

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
VHA National Training Programs for PE and CPT						
Crawford, 2016[77] **Moderate**	69 patients with PTSD and TBI, received PE from 16 providers who were trainees or trained by VHA national program PCL scores from VHA medical records Multivariate logistic models examining predictors of symptom improvement		• Providers were classified on PE experience; trainees (n=12); certified in PE (n=2), completed PE training; or PE trainer involved in national dissemination (n=2) • Predictors included # PE sessions completed, service connection rating, and provider PE experience; provider experience was associated with higher odds of symptom improvement (OR 2.38 [1.03, 5.51]), defined as PCL score <49 and decrease ≥10 points during treatment			
Chard, 2012[87] **Low**	Mental health providers in CPT training program: n=320 respondents to pre- and immediate post-workshop surveys; n= 325 respondents to		• Pre-treatment mean PCL score was 64.1 (53.4, 74.8), post-treatment mean PCL was 45.2 (31.1, 59.3), paired t-test significant (p<0.001) • 10% of patient had PCL <50 pre-	• Comparing pre-and post-workshop mean response scores (Likert scales 1-6 or 1-5) for individual survey items on attitudes to CPT and confidence in CPT skills, authors highlighted positive	• From surveys in March 2008, 89% reported that they would like to be using CPT with more patients; top reasons for not using CPT with more patients were *"having no or little*	

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes Reach	Effectiveness	Adoption	Implementation	Maintenance
	surveys in Mar 2008 (trained in July 2007-Mar 2008), n=237 who also responded to second surveys in Feb 2011; n=541 respondents to surveys in Feb 2011, sent to newly trained providers (Jan 2009-Dec 2010); n=374 Veterans who received CPT from trainees Surveys, response rates 34-49%; patient data from consultations Repeated measures t-tests comparing provider beliefs, symptoms		treatment, 59% had PCL<50 at final session • Pre-treatment mean BDI-II score was 30.9 (19.9, 41.9), post-treatment mean BDI-II was 19.7 (9.6, 29.8), paired t-test significant (p<0.001)	changes: *“Following the training, clinicians indicated a significantly higher level of confidence and greater degree of self-efficacy on all aspects of CPT-specific skills and… components of therapy implementation… Clinician attitudes toward the utility and effectiveness of CPT were also significantly higher following the workshop training.*” (p-values provided for some individual comparisons, but total # comparisons, mean scores and range NR)	*room in their schedule”* (55%) and *“workload is too heavy* (55%); re-survey results in February 2011 had less people reporting these barriers (38% for room in schedule and 37% for heavy workload) • From surveys in February 2011 of newly trained providers, 71% reported that they would like to be using CPT with more patients; top reasons for not using CPT with more patients were still room in schedule (36%) and heavy workload (36%)	
Eftekhari, 2015[82] **Moderate**	3,133 Veterans who received PE from mental health providers in PE training program (n=1,105 who completed 4-day workshop and were in consultation phase);	• *“After adjusting for patient variables, no provider-level variables… significantly predicted* [treatment completion]”	• Pre-treatment mean PCL score was 63.5 (SD 11.5), post-treatment mean PCL was 49.4 (SD 17.1) • Pre-treatment mean BDI-II score was 30.1 (SD=11.4), post-treatment mean BDI-II was 21.8 (SD 13.7)			

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
	Post-workshop surveys of providers; source for patient data NR Mixed-effects models examining provider and patient characteristics associated with treatment completion (≥8 sessions) and changes in symptoms		• *“Profession was the only significant provider-level predictor of clinical outcomes, with social workers achieving slightly greater reductions in PTSD symptom severity* [mean difference on PCL of 2.0 points, p<0.001] *and depression severity* [mean difference on BDI-II of 1.2 points, p<0.01] *than psychologists…”*			
Karlin, 2010[91] **Low**	Mental health providers who completed CPT or PE training (numbers NR), 93 patients who received CPT from trainees, 381 patients who received PE from trainees Surveys of providers and VHA facilities, response rate NR; patient records		• *“Initial program evaluation data reveal an overall average decline of approximately 30% (or 20 points) in* [PCL] *among treatment completers, with similar results for CPT (28%; N=93) and PE (33%; N=381).”*	• Survey in Feb 2009 *“revealed that 96% of facilities were providing CPT or PE; 72% were providing both therapies.*” • Increases in self-efficacy to deliver PE pre- to post-workshop, and post-workshop to post-consultation: mean score 5.49 (SD 0.94) pre-workshop, mean 6.04 (SD 0.58) post-workshop (p<0.001), and mean 6.44 (SD 0.50), p<0.001 for both		

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes Reach	Effectiveness	Adoption	Implementation	Maintenance
	Repeated measures ANOVA for provider attitudes pre- and post-training			comparisons across 3 timepoints		
Rosen, 2017[76] **High**	566 mental health providers who completed PE training 18 months earlier, had responded to 6 months surveys, and currently treating Veterans with PTSD Surveys, response rate 67% Multivariate negative binomial models examining provider and practice characteristics associated with self-reported use of PE (# of current patient with PTSD who are receiving PE)					• 60.4% of providers using PE at 6 and 18 months; 10.2% started using PE at 18 months (were not at 6 months); 16.7% were using PE at 6 months but stopped at 18 months • Mean 1.93 patients (SD 2.32, range 0-20) being treated with PE per provider; median 12% of patients (IQR 0-44%) being treated with PE, among those with PTSD seen weekly, per provider • Significant predictors of number being treated by PE per provider were: male provider (IRR 1.14 [1.05, 1.24], p<0.001); 6 months beliefs that PE is effective (IRR 1.16 [1.04, 1.31], p<0.05) and they can "*generate a steady flow of patient referrals for PE*" (IRR

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes Reach	Effectiveness	Adoption	Implementation	Maintenance
						1.35 [1.21, 1.51], p<0.001); working in PTSD specialty clinic (IRR 1.15 [1.06, 1.26], p<0.001); and pre-training use of group therapy (IRR 0.95 [0.87, 1.04], p<0.05) • Non-significant effects for psychologist vs social worker and other beliefs at 6 months (*eg*, PE may harm patients and self-efficacy to deliver PE)
Ruzek, 2016[80] **High**	766 mental health providers who completed PE training (656 who responded to surveys at all timepoints) Surveys, response rates NR GLM examining changes in provider beliefs during training; multi-variate linear models examining predictors of self-reported intention to use PE (Likert			• Survey items on provider beliefs and attitudes were grouped into 7 subscales: 1) Helping patients improve; 2) Not distressing patients; 3) Positive patient outcomes; 4) Negative patient outcomes; 5) Clinician emotional burden; 6) Clinician time burden; 7) Clinician self-efficacy • Changes in provider beliefs both pre- to post-workshop and post-workshop to post-consultation: *eg*,		

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes Reach	Effectiveness	Adoption	Implementation	Maintenance
	responses 1-7, definitely not to definitely will)			Helping patients improve increased (mean 6.0 [SD 0.8] pre-workshop, 6.5 [SD 0.6] post-workshop, p<0.001); Not distressing patients decreased (mean 4.7 [SD 1.1] pre-workshop, 4.3 [SD 1.0] post-workshop]; and Clinician time burden decreased (mean 2.8 [SD 1.1] post-workshop, 2.3 [SD 1.1] post-consultation, p<0.001) • Post-workshop beliefs that significantly predicted intent to use PE post-consultation: Helping patients improve (B=0.28, p<0.001); Positive patient outcomes (B=0.28, p<0.001); and Clinician time burden (B=-0.14, p<0.001) • Other 4 beliefs were not significant predictors of intent to use PE		
Ruzek, 2017[78]	743 mental health providers who completed PE			• Changes in self-efficacy to promote PE pre- to post-workshop,		• 6 months post-training, providers seeing mean 16.5 (SD

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
High	training 6 months earlier and currently treating patients with PTSD Surveys, response rate 81% Multivariate Poisson models examining provider characteristics associated with self-reported use of PE at 6 months (# of current patient with PTSD who are receiving PE)			and post-workshop to post-consultation were also significant predictors of number patients receiving PE (*eg,* B=0.15, p<0.001, for change post-workshop to post-consultation)		15.9) patients with PTSD per week, 77% using PE with ≥1 patient, mean 2.3 (SD 2.9) patients being treated with PE per provider • Significant predictors of number patients receiving PE: – working in PTSD specialty clinic (B = 0.31, p<0.001) – had more PTSD patients per week before training (B = 0.14 on log scale, p<0.001) – had larger total caseloads before training (B = 0.08 on log scale, p<0.001) – being male (B= 0.22, p<0.001) – some pre-training beliefs (*eg,* PE helps patients, B=0.14, p<0.01; and self-efficacy to deliver PE, B=0.12, p<0.01)
Other VHA Implementation Studies						
Dedert, 2020[73]	778 patients who received treatment	• 63% of patients who attended	• For patients who went to preparatory groups,			

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
Low	in outpatient PTSD clinic VHA medical record data Mixed models examining effect of preparatory groups on reduction in symptoms	preparatory group (72 out of 94) completed PE or CPT; 69% of patients who did not attend preparatory group (398 out of 575) completed treatment, p=0.77 (χ^2 test)	decreases in PCL scores (*eg*, session #1 mean PCL-5 53.2 [SD 14.6], last session mean 48.2 [SD 14.8]), and PHQ-9 (session #1 mean 16.1 [SD 5.2], last session mean 14.7 [SD 5.5]) • For patients who did not attend preparatory groups, larger decreases in PCL scores (*eg*, session #1 mean PCL-5 52.3 [SD 14.4], last session mean 39.8 [SD 18.0]) and PHQ-9 (session #1 mean 15.4 [SD 5.6], last session mean 12.2 [SD 5.8]) • Significant interaction between attending preparatory group and time in predicting PCL and PHQ-9 (p<0.001 and p=0.01, respectively)			
Posse-mato, 2018[75] **High**	279 patients with PTSD in primary care clinic implementing new referral process (CAPE), 374 patients with PTSD	• CAPE clinic:12% of patients were referred to psychotherapy, 5% attended ≥1 session of PE or CPT, 1.4%	• For patients in CAPE clinic, no significant changes in PTSD symptoms or quality of life during 3 months with different mental health treatments, but very small numbers			

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes				
		Reach	Effectiveness	Adoption	Implementation	Maintenance
	in clinic not using CAPE VHA medical records χ^2 tests	completed ≥9 sessions • Non-CAPE clinic: 4% of patients were referred to psychotherapy, 0.8% attended ≥1 session of PE or CPT, 0.3% completed ≥9 sessions • Significant differences between clinics for referrals to psychotherapy (p<0.01) and attending ≥1 session of PE or CPT (p<0.01)	(*eg*, only 9 patients who had any PE or CPT)			
Non-VA Community Clinics						
Charney, 2019[74] **Low**	166 mental health providers in New England, who completed 2-day workshop for PE or CPT 6 months ago, 42 of these also had consultation over 6-month Surveys at 6 and 3 months, response rates 81% and 87%, respectively			• At 3 months: – 85% of those with consultation were using PE or CPT, 35% were mostly or fully comfortable with protocol – 48% of those who only attended workshops were using PE or CPT, 31% were mostly or fully comfortable • At 6 months:	• Immediately after workshop: – 79% reported being mostly or fully prepared to use EBT (3% prior to training) – 71% mostly or fully confident to use EBT (4% prior to training)	

Author, Year; Quality	Participants & Strategy; Data sources; Analyses	RE-AIM Outcomes Reach	Effectiveness	Adoption	Implementation	Maintenance
	Multivariate logistic model examining association of consultation with self-reported use of PE or CPT at 6 months			– 93% of those with consultation were using PE or CPT, 61% were mostly or fully comfortable with protocol – 52% of those who only attended workshops were using PE or CPT, 33% were mostly of fully comfortable with protocol • Consultation associated with use of PE or CPT at 6 months (OR 11.4 [3.2, 40.3], adjusted for PTSD caseload and experience with CBT before training		

Abbreviations. ANOVA=Analysis of variance; B=unstandardized coefficient; BDI-II=Beck Depression Inventory-II; CBT=Cognitive Behavioral Therapy; CPT=Cognitive Processing Therapy; EBP=Evidence-Based Psychotherapies; GLM=Generalized linear model; IQR=Interquartile range; OR=odds ratio; PARIS=Promoting Action on Research Implementation in Health Services; PCL=PTSD Checklist; PCP=Primary Care Provider; PE=Prolonged Exposure Therapy; PHQ-9= Patient Health Questionnaire 9 items; PTSD=Posttraumatic Stress Disorder; SD=Standard deviation; VHA=Veterans Health Administration

Appendix Table G5. KQ2 Articles Evaluating Barriers and Facilitators to Implementation of Trauma-focused Psychotherapies for PTSD (CPT and PE)

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
Veterans Health Administration (VHA) Studies					
Doran, 2019[61] **Low**	8 mental health providers trained in PE and/or CPT Focus groups Consensual Qualitative Research coding system	**Intervention Source:** "[CPT/PE]…*were created and originally tested in civilian populations and then disseminated to the VA… The most prominent issue* [in implementation for veterans]*… were the number of comorbidities and complexities inherent in the veteran population…"* **Evidence Strengths & Quality; Relative Advantage; Complexity:** "*The most commonly identified strengths were the fact that the treatments were evidence-based…*[Also] *many comments…about the helpfulness of the treatment structure—that they are short-term, direct, and relevant/focused…"* *"There were somewhat mixed feelings about the effectiveness of the… treatments among clinicians. A major theme… was that* [they] *are effective in some, but not all, cases… Several*	**Other Patient Attributes:** *"There was also general consensus that* [CPT/PE] *fit and work well for some, but not all, veterans…"* "*The most prominent issue… were the number of comorbidities and complexities inherent in the veteran population…'The people we see… they need so much more. The traumas and the PTSD are so much more complex here…' "*	**Culture:** *"Clinicians felt as if they were pressured to employ an '*[CPT/PE] *or nothing' approach in their work, as well as pressure to 'cure' PTSD in the very short timeframe allotted...: 'It is pretty much all we offer with no flexibility…the VA culture is like it's* [CPT/PE] *or nothing,'…"* **Readiness for Implementation—Available Resources:** "[Providers stated it was] *important…that resources were available for implementation and delivery"*	

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
		clinicians felt that the treatments were useful but not the only means of resolving PTSD…” **Adaptability:** “*There was generally unanimous agreement about the two main perceived weaknesses of the treatments—lack of flexibility and not enough time. The protocols were seen as somewhat rigid and overly structured…*” “[A]*ll agreed that at least occasional flexibility was useful or necessary at times. Flexibility consisted of altering treatment length…”*			
Finley, 2015[71] **Moderate**	128 mental health providers from PTSD clinics Surveys, response rate 21% Multivariate linear models examining predictors of self-reported adherence and use of PE, CPT			**Culture:** • Most providers agreed that organizational politics negatively impacted their work (69%), but also that they were treated fairly by superiors (72%) • Half reported that their accomplishments were acknowledged (56%) • organizational politics and being treated fairly by superiors not associated with use or adherence to CPT/PE	**Knowledge & Beliefs:** • Most providers rated PE was effective (70%), while half rated CPT as effective (56%) • 48% rated supportive care as effective • Those with cognitive-behavioral orientation were more likely to perceive PE as effective (no differences for perception of CPT) • Providing average 4.5 hours of PE per week, 3.9 hours of CPT per week

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
				Readiness for Implementation—Available Resources: • Most reported they had too much clinical work (64%) and administrative work (60%) • Half reported their clinics were understaffed (54%) • Whether clinics sufficiently staffed not associated with use or adherence to CPT/PE	• Perceived effectiveness of PE associated with adherence to manual (p<0.001) and hours of PE per week (p=0.04); cognitive-behavioral orientation not associated with adherence or use • Perceived effectiveness of CPT associated with adherence to manual (p<0.001) and hours of CPT (p<0.001); cognitive-behavioral orientation associated with adherence (p<0.001) but not use (p=0.6)
Garcia, 2019[60] & Garcia, 2020[101] **Moderate**	222-229 mental health providers in PTSD clinical teams Surveys, response rate 24% Multivariate linear models examining predictors of provider reported patient preference for PE, CPT, or other therapies (Likert 1-5				**Other Personal Attributes:** • 68% were psychologists, 32% social workers • 78% with cognitive-behavioral orientation; cognitive behavioral orientation associated with reported patient preference for CPT (p=0.001) and percent time using CPT (p=0.002) but not patient preference for PE or use of PE • 62% had CBT training in graduate school; CBT training not associated with patient preference for or use of CPT or PE

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
	responses) [Garcia, 2019] or percent of time using CPT, PE, or other therapies (0-100%)[101]				
Hamblen, 2015[102] **High**	38 directors of PTSD outpatient programs Semi-structured interviews Codes defined *a priori* based on study objectives and interview questions	**Relative Advantage:** "…[I]*t was not uncommon for options other than PE and CPT (such as anger management and psycho-education) to have equal or at least strong secondary emphasis in the menu of clinical services."*	**Patient Knowledge & Beliefs:** *"…consensus among directors was that* [preparatory] *groups are important because they improve readiness for treatment, help veterans make informed decisions about their treatment plans, improve coping skills and symptom management, and decrease the likelihood of no-shows for scheduled EBTs."*	**Readiness for Implementation—Available Resources:** *"Structural barriers include scheduling problems related to 90 min treatment sessions for PE, resource barriers including not having enough trained providers..."*	**Knowledge & Beliefs:** *"The shift to EBTs was described repeatedly by directors as a 'culture change (where providers) are slowly sort of leaning more toward the idea that folks can move on.' "* *"Providers believe in the efficacy of PE and CPT"* *"…attitudinal barriers including a belief that other treatments were more effective."*
Hundt, 2015[70] **High**	23 patients with PTSD who had CPT/PE Interviews Grounded theory analysis		**Patient Knowledge & Beliefs:** *"Several patients mentioned that therapists who provided a thorough orientation to treatment procedures and methods before beginning* [CPT/PE] *helped allay their fears and increase buy-in. The*[y]*… wanted to know exactly 'what they were getting in for' before they agreed to participate."*	**Provider Decision-making:** *"…several veterans appreciated the opportunity to make choices about which treatment to initiate. One male Persian Gulf veteran in PE described …: 'They kind of explained it to me . . . gave us more detail about what was going on and it was a choice of group or 1 on 1 . . .* [T]*hey had a list that had the different options. And I decided to start (PE) first.' This suggests that*	**Other Personal Attributes:** *"Other participants noted that providers who provided gentle encouragement and expressed confidence in the patient's ability to handle EBP which helped them feel empowered to try EBP without feeling coerced."*

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
			"Therapists also increased buy-in by providing two sources of evidence for the success of these treatments: statistics from treatment outcome research and testimonials about a clinician's own experiences with patient success in [CPT/PE].*"*	*providing options can be an effective way to offer veterans autonomy and increase buy-in to the therapy chosen."*	
Hundt, 2018[62] **Moderate**	24 Veterans referred for PE or CPT, who declined or did not attend any sessions within 1 year Interviews Grounded theory analysis	**Complexity:** *"Lack of continuity of care…made it difficult for some veterans to engage (n = 5; 21%), because they felt exposed or frustrated by telling their story to multiple different providers* [during assessment] … *Veterans' reactions…ranged from describing the process as disorganized to endorsing suspiciousness about the purpose of multiple assessments. They also described feeling overwhelmed by describing their traumas, and felt the assessment was repetitive and intrusive: 'The questions were a little painful . . . it seemed like it lasted forever, and…he kept asking me the same questions over and over and over… But then I talked to this other lady, and she had another set of paperwork that I had to fill out, and I felt like it*	**Patient Needs & Resources:** *"Eleven veterans (46%) endorsed at least 1 practical barrier. Most common were employment/college (n = 8; 33%) and transportation/distance (n = 4; 17%)…Less commonly mentioned…were physical health barriers and caretaking responsibilities."* *"Lack of flexible scheduling (ie, limited weekend and evening hours) was also mentioned as a barrier to engaging (n = 4; 17%)."* **Patient Knowledge & Beliefs:** "*A significant proportion of veterans (n = 6; 25%) had no recollection of either PE or CPT …, despite documentation from medical record review that these patients heard about the options a minimum of 1 to two*	**Networks & Communications:** *"Many veterans (n = 12; 50%) were frustrated by bureaucratic inefficiencies. These issues were not specific to the PTSD clinic and, in fact, were more commonly reported as overall problems with VA care. Examples included 'red tape' and paperwork, difficulties in enrolling in VA and obtaining a primary care doctor, lack of follow up by providers, difficulty calling providers directly, occasions in which promised consults to mental health were not placed, or patients otherwise 'fell through the cracks.' These experiences contributed to feeling that the VA system did not care about them…* [leading to] *overall rejection of the system..."*	

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
		was almost the same as the first set of paperwork that I had to fill out… I just thought oh my gosh. This is just too much.' "	*times during an assessment* …[or] *a group Orientation…Some other veterans reported vague memories of hearing about the therapies but were unable to recall specifics."* "[Some reported] *lack of buy in to the rationale for exposure (n=4; 17%)."*	*"Compounding this were difficulties navigating the complex VA system (n = 4; 17%), such that veterans did not know how to seek the care they wanted."* **Culture:** "[S]*ome veterans (n = 2; 8%) reported that the reputation of the VA was a barrier. Despite not having negative experiences themselves, the media coverage about recent VA controversies and concerns heard from veteran friends or family members made them concerned about the quality of the care they would receive…"* **Readiness for Implementation—Available Resources:** *"Some veterans were uncomfortable with the physical environment of the VA or experiences with other veterans they encountered (n = 6; 25%). They noted that that VA* [facility] *was 'like a maze,' sterile, occasionally dirty, and sometimes had windowless offices, which they contrasted to the plush office environments of private therapists. However, the*	

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
				primary concern…was that the VA was very crowded, which often felt unsafe for veterans with PTSD and associated hypervigilance." **Provider Decision-making:** *"The majority (n=19; 79%) were satisfied with their degree of involvement in their treatment choices ('They make it a habit of…laying out all of the options for you'…)"* **Patient-Provider Relationships:** "…[P]*oor alliance with the therapist offering PE or CPT was an issue for some (n=4; 17%): 'I didn't feel comfortable with (my therapist)…I just didn't feel a sense of compassion there…"* "…[Some reported] *negative experiences with VA medical providers (n = 5; 21%)* [as barriers]…[Some had] *negative experiences with mental health providers outside the PTSD clinic* [n=6; 25%]…*They sometimes felt that providers were rushed, not listening, 'pushing' medications on them, or doubting the veteran's story…*	

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
				‘Most of the doctors that I’ve encountered …just rush you through...’ ” “[T]*he majority (20; 83%) had positive experiences with the therapists they met in the PTSD clinic…18 veterans (75%) had at least 1 positive experience or an overall positive experience with VA mental health…”*	
Lu, 2016[68] **High**	63 patients with PTSD, 15 mental health providers VHA medical records Content analysis of session notes		**Patient Needs & Resources:** *“Veterans frequently reported conflicting obligations as barriers to participation... Competing personal commitments included work, school, family responsibilities, and lack of child care. Limited resources may have added to such burdens… Some veterans had multiple other medical appointments. Barriers related to legal issues included required treatments for driving under the influence convictions and being in jail…”* *“In some cases, anticipation of redeployment interfered with scheduling and caused difficulty focusing on treatment…”*	**Readiness for Implementation—Available Resources** *“In some instances…EBP services were not immediately available, or clinician factors caused potential delays in treatment or necessitated transfer of patient care to another clinician.”* **Provider Decision-making:** *“Providers and veterans had to decide whether PTSD treatment could be integrated with other clinical interventions or whether PTSD treatment needed to be delayed. A provider wrote about an OEF/OIF veteran that he ‘wishes to engage in trauma focused therapy at some point in the future when his*	**Other Personal Attributes:** “*A few* [cases where treatment was] *interrupted due to…*[clinicians] *leaving VA employment, moving and transferring to another [facility], military deployment, or extended leave*...”

Author, Year; Quality	Participants; Data sources; Analyses	Intervention	Outcomes by CFIR Domains Outer Setting	 Inner Setting	 Characteristics of Individuals
			"Distance and geography affected access as well." **Patient Knowledge & Beliefs:** "*Stigma contributed to privacy concerns. These…were cited by a few…still on active duty* [who] *did not want details of treatment shared with their commanding officers."* **Other Patient Attributes:** *"Veterans often had complex presentations, which may have delayed or prevented participation in …[CPT/PE], because they required targeted attention to particular issues over a series of visits. Examples… included substance use disorders, psychotic symptoms, anger, emotional dysregulation, chronic suicidal ideation, difficulty coping with other medical comorbidities, and marital or relationship problems."*	*substance abuse and legal problems are stable.' "*	
Osei-Bonsu, 2016[67] **High**	16 mental health providers Semi-structured interviews		**Other Patient Attributes:** *"Some providers defined 'readiness' as a patient's 'willingness' to engage in a treatment like CPT or PE… Providers reported that*	**Provider Decision-making:** "*Several providers reported using mental processes to make decisions about whether to offer and use CPT and/or PE. They described* [this] *as*	

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
	Content analysis		*patients' ability to adequately cope with the emotional experience of engaging in CPT and PE was also a sign of readiness”* *“Providers also defined readiness in terms of a patient's safety and stability.”* “[P]*resence of comorbid conditions was also considered…Several… discussed the impact of comorbid substance abuse. Some expressed hesitation or ruled out using CPT or PE for* [these] *patients.*”	*their ‘clinical judgment,’ a mental ‘roulette list,’ or ‘decision tree.’… Following…assessment of patient factors, [one] provider indicated that she presents different treatment options that may include CPT and PE and other treatments…For other providers, there seemed to be a pre-treatment decision to offer CPT and PE to nearly every patient.”* “[I]*nstances when certain patient factors led providers…to not discuss or begin CPT or PE. One provider shared that although a patient's inconsistent attendance was driving a decision to not begin CPT or PE, the importance of consistent attendance was not discussed with the patient due to…‘fear that I'd be telling them very explicitly how to avoid having a discussion about [CPT and PE].’… Another provider shared how a patient's poor mental status led to her decision not to begin CPT: ‘[One patient] was very suspicious of everything. He's also having a lot of [legal] issues…’* [A]*lthough* [this]	

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
				patient was referred for CPT, she…did not begin CPT.” *“A few providers reported… the decision to use CPT and/or PE was a product of a collaborative effort between the provider and the patient… ‘I really [want] the decision to be in the hands of the veteran…’ Another provider reported that particularly when the patient’s safety at home is a concern, a ‘joint decision’ is made about whether to proceed with CPT or PE. Other*[s]*…reported that when they introduced CPT or PE, they involved their patient by soliciting the patient’s feedback and discussing patient preferences.”*	
Possemato, 2018[75] **High**	9 members of primary care and mental health leadership Focus groups Deductive content analyses	**Relative Advantage:** *“That patients don’t accept referrals for PTSD treatment is a major problem. PTSD affects physical health and it’s frustrating to only be treating part of the problem.”*		**Implementation Climate—Tension for Change:** *“So many patients refuse PTSD care, this is a problem.”* *“There is a need for more appropriate referrals to the PTSD clinic and for patients to come more ready to engage in services.”*	**Knowledge & Beliefs:** *“Stressing the evidence base of … PTSD specialty care will make the PCPs value this more.”*

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
				Readiness for Implementation—Access to Knowledge & Information: *"PCPs need to know what is offered in the PTSD clinic."* *"PCP needs scripts on how to get resistant patients to the* [mental health] *provider."* *"PCPs need to do a better job recognizing PTSD symptoms to know that PTSD is treatable."*	
Raza, 2015[69] **Moderate**	247 mental health providers who participated in national PE or CPT training program Surveys, response rate NR Descriptive statistics			**Readiness for Implementation—Access to Knowledge & Information:** • "[M]*ajority reported research was somewhat to very strongly helpful for making treatment decisions…"* (n and % NR) • Variability in provider confidence in research by clinical features (*eg*, somewhat less for PTSD with disgust or acts of perpetration [57-58% agreed], and higher for PTSD with shame or guilt 77-80%) but not by types of trauma (*eg*, combat vs noncombat, 84 vs 83%)	**Knowledge & Beliefs:** • 46% preferred PE, 41% had no preference, 13% preferred CPT • "[N]*o significant differences for treatment preference* [PE vs CPT] *across clinician*" demographics, discipline, education, theoretical orientation or personal history of trauma

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
				Provider Decision-making: • More providers selected PE for patients with low literacy (84% vs 1% selecting CPT), low cognitive functioning (70% vs 2% selecting CPT), and moderate-severe TBI (43% vs 4% selecting CPT) • More providers selected CPT for patients with strong guilt (49% vs 13% selecting PE) or shame (45% vs 13% selecting PE) • Most providers selected either PE or CPT for patients with single trauma (64%), mild TBI (62%), or panic attacks (57%) • Most reported they would select treatment based on patient preference (91-92%)	
Ruzek, 2014[72] **Low**	1275 mental health providers enrolled in national PE training program Surveys (pre-training only), response rate 96% Multivariate linear models examining associations				**Knowledge & Beliefs; Self-efficacy; Other Personal Attributes:** • Survey items on provider beliefs and attitudes were grouped based on PCA into 7 subscales: 1) Helping patients improve; 2) Not distressing patients; 3) Positive patient outcomes; 4) Negative patient outcomes; 5) Clinician emotional burden; 6)

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
	between provider characteristics and self-reported beliefs about PE (Likert responses 1-7)				Clinician time burden; 7) Clinician self-efficacy - Provider characteristics included being psychologist vs social worker; CBT orientation (vs some or not); years experience treating PTSD; and clinic type (*eg*, outpatient PTSD, outpatient general mental health) - In separate models, most provider characteristics associated with statistically significant ($p<0.05$), small effects (β=-0.13 to 0.23) in predicting different provider beliefs about PE, with exception of Negative patient outcomes (none of the characteristics were associated with this belief)
Sayer, 2017[65] **Moderate**	96 mental health providers on outpatient PTSD teams (selected based on “reach”— defined as % of psycho-therapy patients who had PT or CPT) Semi-structured interviews	**Evidence Strength & Quality, Relative Advantage:** *“Staff in nearly all of the high reach teams described CPT and PE as being beneficial for the majority of patients with PTSD. Moreover, staff saw these treatments as more effective than other psychotherapies.”* *“Staff at all low reach sites and 1 medium react site reported that although CPT and PE were credible, they did*	**External Policy & Incentives:** “[S]*taff on all teams believed that CPT and PE would continue to be a treatment option for patients with PTSD because VA policy requires their availability…* [S]*taff noted the importance of VA’s continued commitment to training to ensure sustainability.”* **Patient Knowledge & Beliefs:**	**Networks & Communication:** *“All high reach and 1 medium reach site reported having CPT and PE peer consultation groups in which clinical issues were discussed …*[S]*taff had protected time to attend weekly …groups. These…were seen as a valuable resource...”* **Culture; Implementation Climate—Compatibility, Relative Priority:**	**Knowledge & Beliefs:** “[S]*taff in all high and medium reach teams reported commitment to time-limited* [EBP]…*Most…were trained in CPT and PE and new staff were required to know or learn them. As* [a] *mental health chief explained: ‘We have enthusiasm and we engender that in the staff that we hire…I wouldn’t think about hiring someone…that wasn’t willing to devote a lot of time to PE and CPT.’ ”*

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
	Rapid Assessment Process	*not live up to expectations…* [They] *described the clinical benefits as 'partial' or 'not universal.'* " **Adaptability:** "[C]*linicians described trying to follow the CPT and PE manuals, with some flexing to address patient-specific needs… Some staff believed that more research is needed to determine how to adapt the treatments for different types of patients; others believed that lack of adaptability contributed to drop out.*"	*"All high reach teams and 1 medium reach team had developed screening procedures…* [These] *included specifying patient interest in a trauma-focused treatment as a referral criterion and/or requiring patients to undergo an orientation session in which clinic services, including CPT and PE, were described. Thus, patients entering these clinics were likely to be receptive….: '… they go through an orientation group, so they are well versed in what we do here and what we have to offer of options.' "* "[Some] *high reach teams provided a four-session psychoeducational group prior to beginning CPT or PE. One medium reach site used to offer a 10-week psycho-educational group before CPT or PE, but had transferred this group to their general mental health clinic. That team, however, reported difficulty getting patients to agree to begin CPT or PE right away, so most… completed symptom management*	*"All high reach teams identified as…clinics with the primary mission being to deliver PE and CPT….: 'It's always been made clear the kind of program this is, we are evidence-based, we are cognitive-behavioral based. If that does not fit with your orientation, that's OK but we're not going to change, that's what you are going to be doing if you come in here…' "* **—Goals & Feedback:** *"Most high reach teams designed and implemented systems and clinic databases to monitor both treatment process and patient outcomes. Managers… described using outcome data to demonstrate the value of CPT and PE to medical center leadership to maintain support for the resources dedicated to their clinic….: 'We have a specific database…where we track all of our outcomes, pre, mid, and post treatment, assessments, self-report. We also measure drop out, non-engagement, referrals to other programming so that we can*	*"Staff in high and medium reach teams believed that use of CPT and PE benefitted the clinic as well as patients…* [CPT/PE] *helps with staff recruitment because trainees from different disciplines want to learn to deliver them. CPT and PE were described as increasing morale and reducing burnout because clinicians see their patients improve."*

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
			group[s] *before engaging in CPT or PE.”* *“Some staff described how* [CPT/PE] *represented a culture change… VA patients with long histories of receiving open-ended supportive psychotherapy and their therapists may not find an episode-of-care model or the possibility of recovery credible.”* **General Practice Climate & Patterns:** “[S]*taff at most low reach sites and 1 high reach site believed* [CPT/PE] *did not fit with the emphasis on psycho-dynamic psychotherapies within the larger community.”*	*really be accountable to our outcomes…’ ”* **Readiness for Implementation—Leadership Engagement:** *“All high and medium reach teams reported that their team leader was highly engaged in sustained implementation of CPT and PE. The team leader had clinical expertise in CPT and/or PE and was described as a champion.”* **—Available Resources:** *“Most high reach teams designed and implemented systems and clinic databases to monitor both treatment process and patient outcomes.* *“All high reach and 1 medium reach site reported having CPT and PE peer consultation groups in which clinical issues were discussed …*[S]*taff had protected time to attend weekly …groups. These…were seen as a valuable resource...”* *“Nearly all teams noted that therapists need to be able to manage their own schedules*	

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
				to effectively deliver [CPT/PE]. *Changes in scheduling procedures were made at 1 low reach site as part of an effort to increase reach….: 'That was 1 of the big changes…and probably the most important 1 was… providers… could schedule as they wanted.' "*	
Song, 2020[58] **Moderate**	225 mental health providers in PTSD clinical teams Surveys Mediation analyses				**Other Personal Attributes:** • Graduate school training in structured CBT was not associated with provider use of PT or CPT (measured as percent of clinical time, exclusion options—CPT individual; CPT group; CPT cognitive only; PE; or other psychotherapy)
US Community Clinics & Health Systems					
Finley, 2018[63] **Moderate**	463 mental health providers in Texas, some trained in CPT by state program Surveys, response rate 15% Descriptive statistics for perceived		**External Policies & Incentives:** • Most reported ability to receive reimbursement for PTSD care (66%)	**Implementation Climate—Compatibility:** • Most reported PTSD therapy *"Fits well with the way I like to work"* (64%), and ease of incorporating PTSD care into work (70%) • Few noted it *"would be complicated in my practice"* (18%) • Perceived barriers (as a whole) were not associated with odds of use of CPT or	**Knowledge & Belief:** • Most psychologists were aware of any clinical practice guidelines for PTSD (61%), 37% of masters-level providers did • Few aware of VHA guidelines for PTSD (25% of psychologists, 12% of masters-level providers)

Author, Year; Quality	Participants; Data sources; Analyses	Outcomes by CFIR Domains			
		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
	barriers, training, and use of PE and CPT; multivariate logistic models examining provider characteristics associated with use of PE or CPT			PE, overall low barriers reported	**Self-efficacy:** • 65% of psychologists reported confidence in PTSD assessment, vs 48% of masters-level providers • Confidence in ability to use CPT associated with self-reported use of CPT (OR 5.7 [2.4, 13.7]), confidence in PE associated with use of PE (OR 9.1 [2.8, 29.8]) **Other Personal Attributes:** • 78% of psychologists were trained in CBT, 23% in CPT, 16% in PE • 32% of masters-level providers were trained in CBT, 25% in CPT, 8% in PE • Prior training in CPT associated with use of CPT (OR 34.0 [13.0, 89.0]), training in PE associated with use of PE (OR 22.7 [6.7, 76.5])
Richards, 2017[66] **Low**	352 mental health providers in New England Surveys, response rate NR			**Readiness for Implementation—Available Resources:** • Among providers interested in training (87%), top reported barriers to training were time away from work (56%), and high cost of training (52%)	**Other Personal Attributes:** • 16% were trained in PE, 51% among these reported use of PE • 28% were trained in CPT, 72% among these reported use of CPT • Having received supervision during training associated

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		Intervention	Outer Setting	Inner Setting	Characteristics of Individuals
	Descriptive statistics for perceived barriers to training; multivariate logistic models examining predictors of use of PE and/or CPT				with higher odds of use (OR 10.9 [3.4, 35.4]), but results NR for other predictors (*eg*, years of practice)

Abbreviations. β=coefficient in analytic models; CBT=Cognitive Behavioral Therapy; CPT=Cognitive Processing Therapy; EBP=Evidence-Based Psychotherapies; GP=General Practitioner; NR=Not Reported; PCA=Principal components analysis; PCP=Primary care provider; PARIS=Promoting Action on Research Implementation in Health Services; PCL=PTSD Checklist; PE=Prolonged Exposure Therapy; PTSD=Posttraumatic Stress Disorder; VA=Department of Veterans Affairs