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# Internet and Mobile Interventions for Adults with PTSD and Their Family Members

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## PREFACE

The VA Evidence Synthesis Program (ESP) was established in 2007 to conduct timely, rigorous, and independent systematic reviews to support VA clinicians, program leadership, and policymakers improve the health of Veterans. ESP reviews have been used to develop evidence-informed clinical policies, practice guidelines, and performance measures; to guide implementation of programs and services that improve Veterans' health and wellbeing; and to set the direction of research to close important evidence gaps. Four ESP Centers are located across the US. Centers are led by recognized experts in evidence synthesis, often with roles as practicing VA clinicians. The Coordinating Center, located in Portland, Oregon, manages program operations, ensures methodological consistency and quality of products, engages with stakeholders, and addresses urgent evidence synthesis needs.

Nominations of review topics are solicited several times each year and submitted via the [ESP website](#). Topics are selected based on the availability of relevant evidence and the likelihood that a review on the topic would be feasible and have broad utility across the VA system. If selected, topics are refined with input from Operational Partners (below), ESP staff, and additional subject matter experts. Draft ESP reviews undergo external peer review to ensure they are methodologically sound, unbiased, and include all important evidence on the topic. Peer reviewers must disclose any relevant financial or non-financial conflicts of interest. In seeking broad expertise and perspectives during review development, conflicting viewpoints are common and often result in productive scientific discourse that improves the relevance and rigor of the review. The ESP works to balance divergent views and to manage or mitigate potential conflicts of interest.

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### ***Operational Partners***

Operational partners are system-level stakeholders who help ensure relevance of the review topic to the VA, contribute to the development of and approve final project scope and timeframe for completion, provide feedback on the draft report, and provide consultation on strategies for dissemination of the report to the field and relevant groups.

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### Disclosures

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The findings and conclusions in this document are those of the author(s) who are responsible for its contents and do not necessarily represent the views of the Department of Veterans Affairs or the United States government. Therefore, no statement in this article should be construed as an official position of the Department of Veterans Affairs. The final research questions, methodology, and/or conclusions may not necessarily represent the views of contributing operational and content experts. No investigators have affiliations or financial involvement (eg, employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties) that conflict with material presented in the report.

# *Executive Summary*

## KEY FINDINGS

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- ▶ Internet and mobile interventions may have small to negligible benefits on posttraumatic stress disorder (PTSD) and depression outcomes for military Veterans and service members (low strength of evidence [SOE]). Findings are based on mostly randomized controlled trials (RCTs) of internet-based cognitive behavioral therapy (iCBT) that varied in comparison condition, treatment duration, and level of facilitation. Studies had notable methodological limitations and inconsistent results.
  - ▶ Internet and mobile interventions may have small to moderate short-term benefits on PTSD and depressive symptoms for civilian populations, but do not appear to be long lasting (low SOE).
  - ▶ Symptom improvement appeared to be largest for interventions with greater provider facilitation, compared with interventions with minimal or no provider support.
  - ▶ It is unclear whether internet and mobile interventions for caregivers and family members of adults with PTSD improve stress, coping, or mental health symptoms (low SOE). Only 5 studies were identified and effectiveness differed across studies.
  - ▶ Gaps to address in future research include whether increased levels of direct therapeutic involvement with trauma-focused iCBTs increases the effectiveness of treatments in military populations. Future studies might also explore whether internet and mobile resources have a beneficial role in supporting the established VA clinical pathway for PTSD, for example to improve treatment adherence or facilitate at-home activities that reinforce principles and practices introduced during in-person therapy.
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Approximately 10% of United States (US) military Veterans experience posttraumatic stress disorder (PTSD) at some point in their lifetime. Untreated PTSD is associated with significant functional impairment, high rates of psychiatric and medical comorbidities, substance misuse, and death by suicide. PTSD is treatable for many people, and the Department of Veterans Affairs (VA) and Department of Defense (DoD) have invested significant resources in developing and broadly implementing clinical pathways that incorporate effective therapeutic approaches. However, despite these considerable advancements in trauma-focused care, most Veterans with PTSD still do not access and benefit from PTSD treatments.

Virtual treatments, in which a provider delivers evidence-based therapies via synchronous telehealth, are now largely considered equivalent to in-person therapy for PTSD. Self-guided, asynchronous PTSD treatments that use the internet or mobile phone applications have also become available in recent years. These interventions—which are offered with varying levels of therapeutic support but are generally lower intensity than conventional in-person therapies—have the potential to expand access to effective PTSD treatments to anyone with internet access or a smartphone.

Internet and mobile interventions have also been developed to provide a more accessible means of support to family members and caregivers of adults with PTSD, who often experience psychological distress, caregiver burden, and diminished well-being.

## CURRENT REVIEW

The aim of this review is to synthesize the available evidence on the effectiveness of internet and mobile interventions for individuals with PTSD and family members or caregivers of individuals with PTSD.

Primary outcomes of interest were PTSD and depression symptom severity, and a sufficiently large number of studies were identified in Veterans or active-duty service members to allow for reporting of these outcomes separately for military and civilian populations. We were also interested in intervention and study methodological characteristics that may influence intervention effects on PTSD and depression symptom severity. These characteristics were 1) intervention modality, 2) level of facilitation, 3) intervention duration, 4) presence or absence of a written exposure component, 5) outcome assessment method, and 6) comparison group type.

Sixty primary studies met eligibility criteria, including 36 RCTs, 1 non-randomized trial, 1 cohort study, and 22 pre-post studies. Most studies were conducted in individuals with PTSD, and evidence from comparative studies ( $k = 36$ ) was prioritized over evidence from pre-post studies in this population. All available evidence was considered for interventions conducted among family members and caregivers.

Most comparative studies of internet and mobile interventions for adults with PTSD were conducted in the US, and 13 were enrolled Veterans or military Service members. Most studies evaluated internet-based CBT (iCBT) interventions, though there was considerable variation across studies in the proportion of participants meeting diagnostic criteria for PTSD; the intervention modality, duration, and level of facilitation; and in the type of comparison conditions and outcomes assessed.

Thirty-two studies assessed the effectiveness of internet or mobile interventions on PTSD symptoms immediately post-treatment (31 RCTs, 1 cohort; total  $N = 2,237$ ). Of these, 21 studies were conducted in civilian populations (total  $N = 1,655$ ) and 11 in military populations (Veterans or active-duty service members; total  $N = 582$ ). Results of meta-analyses of these studies indicate differential effectiveness of internet and mobile interventions for PTSD for civilian and military populations. Interventions may be moderately effective in reducing PTSD and depression severity in civilians, immediately post-treatment. In comparison, military populations may experience small to negligible benefits from treatments. For both populations, no treatment effects were evident at shorter and longer-term follow-up periods. We have low confidence in findings (low strength of evidence) because of study methodological limitations and moderate inconsistency in effects across studies.

Five studies (2 RCTs, 3 pre-post studies) on internet and mobile interventions for family members or caregivers of adults with PTSD were identified. Four studies evaluated internet interventions, and 1 evaluated an app-based intervention. All studies were conducted among intimate partners or family members or Veterans, military service members, or first responders with PTSD. Studies reported on a variety of outcome measures. Four outcomes that were reported by at least 2 studies were included in our synthesis: caregiver burden, depression, anxiety, and quality of life. Across treatments and outcomes, there was limited evidence of any consistent treatment effects. Most studies had high risk of bias and the strength of evidence across outcomes was low.

Military Veterans and service members may experience small to negligible benefits on PTSD and depressive symptoms from self-guided, asynchronous PTSD treatments. Civilians may experience moderate benefits at post-treatment, but these gains do not appear to be sustained. Consequently, the

available evidence does not currently support internet and mobile interventions as an effective treatment for military populations with PTSD. Based on a small evidence base, internet and mobile interventions do not appear to benefit family members of adults with PTSD.

Examining intervention characteristics that may influence effectiveness suggests that the level of facilitation could be a key factor in the effectiveness of internet and mobile interventions for PTSD. Future research should examine whether greater direct therapeutic involvement with trauma-focused iCBTs increases the effectiveness of treatments for military populations. Future studies might also explore whether internet and mobile resources have a beneficial role in supporting the established VA clinical pathway for PTSD, for example to improve treatment adherence or facilitate at-home activities that reinforce principles and practices introduced during in-person therapy.

### ES Table. Summary of Evidence

Outcome	Evidence	Findings
<i>Posttraumatic stress disorder</i>		
PTSD symptom severity at PT	31 RCTs and 1 cohort study	<i>Low SOE:</i> Internet and mobile interventions for PTSD may improve PTSD symptom severity at post-treatment among civilians but may have no effect among Veteran/military populations.
PTSD symptom severity at 1-3 months	18 RCTs	<i>Low SOE:</i> Internet and mobile interventions for PTSD may have no effect on PTSD symptom severity 1-3 months post-treatment.
PTSD symptom severity at 4+ months	5 RCTs	<i>Low SOE:</i> Internet and mobile interventions for PTSD may have no effect on PTSD symptom severity 4+ months post-treatment.
Clinically significant PTSD symptom improvement from PT to 3 months	9 RCTs and 1 NRT	<i>Low SOE:</i> Internet and mobile interventions may increase the odds of clinically meaningful PTSD symptom improvement among civilian but not military populations.
No longer meeting PTSD criteria, recovered, or remission from PT to 3 months	10 RCTs	<i>Low SOE:</i> Internet and mobile interventions for PTSD may increase the odds of recovery, remission, or no longer meeting PTSD diagnostic criteria.
Reliable improvement or change from PT to 3 months	5 RCTs and 1 cohort study	<i>Low SOE:</i> Internet and mobile interventions for PTSD may increase the odds of reliable symptom improvement or change.
<i>Depression</i>		
Depression symptom severity at PT	19 RCTs and 1 NRT	<i>Low SOE:</i> Internet and mobile interventions for PTSD may have a small effect on depression symptom severity at post-treatment among civilians but may have no effect among Veteran/military populations.
Depression symptom severity at 1-3 months	10 RCTs	<i>Low SOE:</i> Internet and mobile interventions for PTSD may have no effect on depression symptom severity 1-3 months post-treatment.

*Abbreviations.* NRT=non-randomized trial; PT=post-treatment; TSD=posttraumatic stress disorder; RCT=randomized controlled trial; SOE=strength of evidence.