A Scoping Review of Psychological Interventions for PTSD in Military Personnel and Veterans

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A Scoping Review of Psychological Interventions for PTSD in Military Personnel and Veterans

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Post-traumatic stress disorder (PTSD) has emerged as a key concern for military and veteran populations. This article describes what is being done programmatically and therapeutically to treat PTSD in military personnel and veterans returning from deployment. This scoping review demonstrates that (1) research published in this area has been rapidly increasing since its inception in the 1980s; (2) the vast majority of articles focus on cognitive-behavioral approaches to treatment, and this area of the literature presents strong evidence for these approaches; and (3) there is a lack of randomized controlled trials for treatments, such as art therapies and group therapies.

Keywords: PTSD, Post-traumatic stress, military, veterans, scoping review, evidence-based medicine, intervention, therapy, program, cognitive-behavioral

INTRODUCTION

There is an increasing awareness of problems resulting from war trauma. Since its initial DSM-III formulation in 1980, post-traumatic stress disorder (PTSD) has gained considerable attention in the literature concerning its treatment. In the introduction to their edited collection, Effective Treatments for PTSD (Second Edition), Edna B. Foa, Terence M. Keane, Matthew J. Friedman, and Judith A. Cohen (2010) state that quality studies on interventions for PTSD have been increasing rapidly in the past 25 years. Although psychotherapeutic and pharmacological interventions both characterize this literature, the present scoping review focuses only on the psychotherapeutic literature.

Although a growing number of quality studies are assessing the effectiveness of psychotherapeutic interventions for PTSD, this evidence is often not put into practice. An analysis of U.S. Veterans Health Administration outpatient PTSD clinics in New England found that only 6.3% of the study population received at least one session of evidence-based psychotherapy during their initial six months in treatment (Shiner et al., 2013). In the Canadian context, Monson (2013) states that “research suggests that a minority of clinicians provide evidence-based therapies in clinical settings.” To improve the lives of those affected with PTSD, it is important that research is available and utilized by clinicians.

The purpose of our research is to review the international academic literature for psychotherapeutic treatments for PTSD in veterans and military personnel. The main contribution of this research is to provide a characterization of a large number of studies on various types of psychotherapeutic treatments. By evaluating the quality of methodological support for various treatments, this study goes beyond the scope of a typical meta-analysis which focuses solely on high-quality studies for a specific treatment only. Without restricting the study to a specific treatment or methodological orientation, this scoping review provides a broader overview of the recent rapid development of literature on psychotherapeutic interventions for PTSD. Along with providing a map of the literature for clinicians in the area, this scoping review provides recommendations for future research by showing which psychotherapeutic interventions are receiving significant attention in terms of antidotal evidence but lacking support from studies with a more rigorous methodology. The unique contribution of this scoping review is descriptive and prescriptive; it provides a topological overview characterizing the literature in this area, as well as suggesting areas where future research can be done.
This review primarily assesses six major areas of research: cognitive-behavioral therapies, group therapies, distance therapies, relaxation therapies, art therapies, and novel therapies.

Cognitive-behavioral therapies are most prominent in the literature on therapeutic interventions for PTSD in military and veteran populations. The major forms of cognitive-behavioral therapies in this study include prolonged or direct therapeutic exposure, virtual reality, and cognitive processing therapy. Prolonged or direct therapeutic exposure consists of exposing the patient to distressing stimuli at increasing intervals over a prolonged period of several months to several years within and outside of therapy sessions. Virtual-reality exposure uses this same technique but simulates the distressing stimulus using the vivid sensations produced within a virtual environment. Sensations include sights, sounds, and even scents associated with distressing stimuli, such as explosions and gunfire. Cognitive-processing therapy uses the same principle of reducing avoidance through confronting distressing stimuli but operates on the more abstract level of confronting distressing mental representations. This form of therapy teaches patients cognitive tools that allow them to modify the meaning attributed to a trauma so that they can understand the event within its original context.

METHODS

This study employs a scoping review approach to scan an extensive body of literature to determine how the research question is addressed in the literature. According to Arksey & O’Malley (2005) the scoping review unfolds in five stages: (1) identify the research questions, (2) identify relevant studies, (3) determine and apply inclusion and exclusion criteria, (4) chart the data, and (5) summarize and report the results (Levac, Colquhoun, & O’Brien, 2010). This study is guided by the following research question: What are the current psychotherapeutic treatments for PTSD in veterans and military personnel?

The literature search covered indexed, published, peer-reviewed literature from 1980 to 2013. The databases consulted include MEDLINE, EMBASE, and PsycINFO. Search strategies included the following keywords: military, veteran, PTSD, treatment, program, and therapy. The following specific psychotherapeutic treatments were also included as keywords: music therapy, occupational therapy, virtual reality exposure therapy, behaviour therapy, relaxation therapy, cognitive therapy, and psychoanalytic therapy. Combined into various search strategies, these keywords yielded 5,141 search results. Of these results, 1,439 were duplicates, bringing the total search yield to 3,702 new results from the aforementioned databases. Results included journal articles, dissertations, letters to the journal editor, and book chapters.

Articles were excluded from this study by reviewing the titles, abstracts, and body of the text for relevance. Articles were excluded if they did not focus on veterans or military personnel, or did not focus on the assessment of a psychotherapeutic intervention for PTSD. After applying the exclusion criteria, 284 articles were included in this study.

Articles were then charted based on the following categories: author, title, year of publication, specific type of intervention, country of the study, population studied, and journal of publication, methods used, and conclusions of the study. When charting the data, six therapeutic themes emerged: cognitive-behavioral therapies, group therapies, distance therapies (i.e., telephone based), art therapies, relaxation therapies, and other therapies (novel interventions without sufficient thematic clusters).

RESULTS

The results of this scoping review are based on the following criteria: (1) level of evidence, (2) year of publication, (3) nationality of population studied, and (4) therapeutic type. This allows for an overview of the growth of the literature in recent years, the main interventions receiving attention, and the strength of evidence supporting various treatments.

Evidence for Interventions

The levels of evidence presented here are based on the classifications of Sackett, Straus, Richardson, Rosenberg, and Haynes (2000):

<table>
<thead>
<tr>
<th>Intervention Type</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
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<td>19</td>
<td>18</td>
<td>69</td>
<td>13</td>
<td>49</td>
<td>168 (62%)</td>
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<td>Group therapies</td>
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<td>2</td>
<td>7</td>
<td>1</td>
<td>18</td>
<td>30 (11%)</td>
</tr>
<tr>
<td>Distance therapies</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>13</td>
<td>30 (5%)</td>
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<tr>
<td>Relaxation therapies</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>26 (3%)</td>
</tr>
<tr>
<td>Art therapies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novel therapies</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>26</td>
<td>40 (15%)</td>
</tr>
</tbody>
</table>
Level 1 evidence: Randomized clinical trials
Level 2 evidence: Quasi-experimental studies such as prospective studies, and non-randomized comparison groups
Level 3 evidence: Pre-experimental studies, such as uncontrolled studies, posttest only designs
Level 4 evidence: Observational studies including case series, and historical/retrospective reviews
Level 5 evidence: Surveys, case reports, single-subject studies, and expert opinion

This ranking system, based on the work of Sackett and colleagues (2000), corresponds with that of the Oxford Centre for Evidence-Based Medicine (2009). Regarding evidence for therapies, level one evidence requires experiments to be randomized and controlled. Experiments that used a pre–post measure but lacked randomization in their control/comparison group are labeled level two. Experiments that lacked a control/comparison group or use a posttest-only design are labeled level three. Observational studies that rely on strictly retrospective patient chart reviews or case series are labeled level four. Last, level five studies consist of anecdotal evidence from either qualitative single-subject case studies or expert opinion. Each of the three reviewers came to a mutual agreement regarding each study’s ranking. In the case of a differing view, the reviewers engaged in dialogue to come to mutual agreement.

Publications by Year

Figure 1 displays the number of publications per year from 2003 to June 2013 as categorized by level of evidence.

Publications by Country

Of the 284 studies in this review, 256 articles (roughly 90%) focus on veterans or military personnel from the United States. Other countries include Australia (nine publications), Israel (six publications), Croatia (five publications), the Netherlands (two publications), and Canada, China, Columbia, Germany, Norway, and Portugal (one publication each).

Publications by Intervention Type

The literature in support of psychotherapeutic interventions is classified based on five broad thematic categories: Cognitive-behavioral therapies are the focus of 168 articles (refer to Appendix 1 for a full list of subcategories), group therapies are the focus of 30 articles, distance therapies (web or telephone based) are the focus of 13 articles, relaxation therapies are the focus of 10 articles, and art therapies are the focus of 8 articles (refer to Appendix 2).

There are also 43 articles that focus on 27 other therapies that do not fit into the five previously defined categories and do not form large or distinct clusters; these are listed as novel interventions in this article (refer to Appendix 3 for a full list of these therapies).

Table 1 contains a summary of articles that support the effectiveness of each major type of psychotherapeutic intervention in this review. Of the 269 articles listed in Table 1, 15 additional articles are not included because those studies do not support the effectiveness of psychotherapeutic interventions. See Appendix 4 for this group of studies; EMDR
particularly stands out in this literature as a treatment that has a significant amount of evidence against it.

DISCUSSION

Overall, our conclusions confirm the assertions of Foa and colleagues (2010) that quality studies on psychotherapeutic interventions for PTSD have been increasing rapidly in the past 25 years. Particularly since 2007, the number of studies published has grown sharply. Although only part of 2013 is represented in this study, the results for that year lead us to be optimistic about the growth in quality of studies, as a much larger proportion of level one studies were published in that partial year compared to all previous years.

Cognitive-Behavioral Therapies

Cognitive-behavioral therapy (CBT) received the vast majority of attention in the literature with roughly 62% of the articles dedicated to assessing the effectiveness of its various forms. Prominent forms of CBT that received attention in this literature include prolonged or direct therapeutic exposure (five level 1 studies), virtual-reality exposure (three level 1 studies), and cognitive processing (three level 1 studies).

Group Therapies

Group therapies composed roughly 11% of the total studies appearing in this review. Studies in this area were distinguished based on the attention given to the importance of group dynamics in healing from trauma. A prominent form of group therapy in this review includes spiritually integrated therapy (one level 1 and one level 2 studies). This is a group therapy focused on religious meaning making to reduce religious strain following a military-related trauma.

Distance Therapies

Distance therapies compose roughly 5% of the total studies appearing in this review. Studies in this area were distinguished based on their attention given to the effectiveness of therapeutic methods administered through telephone or webcam. The concept of “telemedicine” appeared to be a prominent label applied to these techniques in the literature. With three level 1 studies, therapies administered by telephone or webcam are shown to be effective and comparable to in-person treatments. Other benefits mentioned in the literature state the improved treatment access for rural veterans and the opportunity to potentially reduce treatment dropout rates.

Relaxation Therapies

Relaxation therapies compose roughly 3.5% of studies appearing in this review. Studies in this area were distinguished based on their attention given to methods of mental or physical relaxation. Prominent forms of relaxation therapies include guided imagery (one level 1 study), sleep-focused mind-body bridging (one level 1 study), and meditation-based stress-reduction (one level 3 and one level 5 study). Guided imagery includes a therapist’s use of relaxing mental stimuli to guide the thoughts of the patient. Sleep-focused mind-body bridging includes the use of techniques that increase the patient’s awareness of dysfunctional mental and physical states, such as self-centeredness, rumination, and body tension. The studies that focus on meditation-based stress reduction use the technique of mantra repetition and transcendental meditation.

Art Therapies

Art therapies compose roughly 3% of the studies appearing in this review. Prominent forms include group music therapy and drawing. All of the studies in this area had level 4 or level 5 evidence.

Novel Therapies

Novel therapies compose roughly 15% of the studies in this review. In all, 28 different therapies are studied in the 40 articles that compose this category. Therapies were classified as novel if they received attention in five or fewer articles. Most therapies in this category received attention in only one or two articles. Prominent therapies in this category include yoga (two level 1 studies) and canine-assisted therapy (five level 5 studies). Although canine-assisted therapy has only level five evidence, it stands out as a novel intervention because it appears five times, suggesting it is getting a significant amount of attention despite the lack of quality evidence. For a full list of novel therapies, see Appendix 3.

CONCLUSION

In conclusion, this scoping review has provided a characterization of the literature on psychotherapeutic interventions for PTSD among military and veteran populations. It has demonstrated the dramatic rise of research in this area in the past 10 years and that an extremely high proportion of these studies come from the United States. It has also demonstrated that the largest cluster of studies assess cognitive-behavioral therapies, followed by group therapies, distance therapies, relaxation therapies, and art therapies, as well as more recently popular smaller clusters of novel interventions, such as yoga and canine-assisted therapy.
There are a large number of studies assessing cognitive-behavioral therapies, many employing a high methodological standard. Going forward, it would be beneficial to conduct a meta-analysis on cognitive-behavioral psychotherapeutic interventions for PTSD among military and veteran populations. Although group therapies, distance therapies, and relaxation therapies are gaining traction, they lack in a significant number of quality studies. Future research would benefit from investigating the added value of these therapies as adjuncts to a cognitive-behavioral treatment regimen. Art therapy is an area that completely lacks quality studies, mainly reporting single-subject case studies or expert opinion. Canine-assisted therapy is a novel therapeutic intervention that also showed a significant cluster of anecdotal evidence and expert opinion, having no quality studies. Experimental research is needed for both art therapy and canine-assisted therapy.

Overall, the explosion of research on psychotherapeutic interventions for PTSD among military and veteran populations demonstrates hope for the future of treatment. With quality studies on various cognitive-behavioral therapies paving the way for evidence-based intervention, we hope that other innovative therapies will follow.

REFERENCES
### APPENDIX 1. SUMMARY OF EVIDENCE IN SUPPORT OF COGNITIVE-BEHAVIORAL INTERVENTIONS

<table>
<thead>
<tr>
<th>Type of CBT</th>
<th>Level 1</th>
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<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
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</thead>
<tbody>
<tr>
<td>Prolonged or direct therapeutic exposure</td>
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<td>6 7 8</td>
<td>9 10 11 12 13 14</td>
<td>15 16 17 18 19 20 21</td>
<td>22 23 24 25 26 27</td>
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<tr>
<td>Virtual-reality exposure</td>
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<td>37</td>
<td>38 39 40 41 42 43</td>
<td>44 45 46 47 48</td>
<td>49 50 51</td>
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<td>Imagery rehearsal</td>
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<td>70 71 72</td>
<td>73</td>
<td>74 75 76 77</td>
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<td>Cognitive processing</td>
<td>78 79 80</td>
<td>81 82</td>
<td>83 84 85 86</td>
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<td></td>
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<tr>
<td>Mindfulness based</td>
<td>87</td>
<td></td>
<td>88 89 90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral activation</td>
<td></td>
<td></td>
<td>91 92</td>
<td></td>
<td>93</td>
</tr>
<tr>
<td>EMDR*</td>
<td>94 95</td>
<td>96 97 98</td>
<td>99</td>
<td>100 101 102 103</td>
<td>104 105 106 107 108 109 110</td>
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<tr>
<td>Group CBT**</td>
<td>111</td>
<td>112</td>
<td>113 114 115 116</td>
<td>128</td>
<td>129 130 131</td>
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<td>Systematic desensitization</td>
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<td>117 118 119</td>
<td>120 121 122</td>
<td>123 124 125 126 127</td>
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<td>Behavioral family therapy</td>
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<td>128</td>
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<tr>
<td>Behavioral activation + therapeutic exposure</td>
<td>146</td>
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<tr>
<td>Couple’s CBT</td>
<td>147</td>
<td>148 149</td>
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<tr>
<td>Dialectical behavior therapy</td>
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<tr>
<td>Emotional clarity and cognitive reappraisal</td>
<td>151</td>
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<tr>
<td>Prolonged exposure + stress inoculation training</td>
<td>152 153</td>
<td></td>
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<tr>
<td>Cognitive-behavioral anger treatment</td>
<td></td>
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<tr>
<td>Cognitive-behavioral therapy for insomnia</td>
<td>155</td>
<td>156 157</td>
<td></td>
<td></td>
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<tr>
<td>Cognitive processing therapy + prolonged exposure therapy</td>
<td>158</td>
<td></td>
<td></td>
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<tr>
<td>Holographic reprocessing</td>
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<tr>
<td>Acceptance and commitment therapy</td>
<td>160</td>
<td></td>
<td>161</td>
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<td></td>
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<tr>
<td>Imagery rescripting and reprocessing therapy</td>
<td>162</td>
<td></td>
<td></td>
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<tr>
<td>Schema-focused therapy</td>
<td>163</td>
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<tr>
<td>Trauma management therapy</td>
<td>164 165</td>
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<tr>
<td>Adaptive disclosure</td>
<td>167</td>
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<td>Cognitive behavioral social rhythm therapy</td>
<td>168</td>
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</table>

**Notes.** *EMDR* = Eye movement desensitization and reprocessing; **CBT** = Cognitive-behavioral therapy.

### APPENDIX 2. SUMMARY OF EVIDENCE FOR THE EFFECTIVENESS OF OTHER FORMS OF THERAPY

<table>
<thead>
<tr>
<th>Type of Intervention</th>
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<td>Group therapies</td>
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<td>171 172</td>
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<td>181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198</td>
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<tr>
<td>Distance interventions</td>
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<td>Relaxation techniques</td>
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<td>217 218 219 220 221</td>
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<td>Art therapies</td>
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### APPENDIX 3. SUMMARY OF EVIDENCE FOR NOVEL INTERVENTIONS

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<td>Acupoint tapping (adjunct to exposure)</td>
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<td>Adlerian natural high therapy</td>
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<td>Bright light therapy</td>
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<td>Canine-assisted therapy</td>
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<td>Emotional freedom techniques (adjunctive)</td>
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<td>Existential therapy</td>
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<td>Mythological studies approach</td>
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<td>Nature adventure rehabilitation</td>
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<td>Outward bound experience</td>
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<td>Group physical activity program</td>
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<td>Psychodynamic psychotherapy</td>
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### APPENDIX 4. EVIDENCE REPORTING THE INEFFECTIVENESS OR VERY LIMITED EFFECTIVENESS OF INTERVENTIONS

<table>
<thead>
<tr>
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APPENDICES 1 THROUGH 4 REFERENCES


combat-related PTSD. *Pragmatic Case Studies in Psychotherapy, 1*(2), 1–25.


sleep disturbance in veterans with PTSD: A pilot study. 
Journal of Clinical Sleep Medicine, 7(1), 57–68.
Psychiatric Services, 59(9), 996–1003.
Sleep, 32, A361.
Journal of Clinical Sleep Medicine, 6(5), 487–488.
Journal of Anxiety Disorders, 26(3), 442–452.
Rehabilitation Psychology, 58(1), 36–42.
Pain Medicine (Malden, Mass.), 10(7), 1300–1311.
Psychotherapy, 45(3), 361–376.
Psychiatry Research, 200(2–3), 609–613.
Psychological Trauma: Theory, Research, Practice, and Policy, 4(2), 221–228.
Journal of Traumatic Stress, 23(4), 491–495.


