



Internet-based interventions for posttraumatic stress: A meta-analysis of randomized controlled trials



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HIGHLIGHTS

- CBT-IBIs reduce PTSD symptoms significantly at post-test compared to passive controls.
- CBT-IBIs with different components are all more efficacious than passive controls.
- CBT- and EW-IBIs are not superior to active control conditions.
- Efficacy of CBT-IBIs is given at post-test, but does not carry through to follow-up.
- However, the number of studies was low for sufficiently powered testing.

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ABSTRACT

Posttraumatic stress disorder (PTSD) is a prevalent and highly distressing affliction, but access to trauma-focused psychotherapy is limited. Internet-based interventions (IBIs) could improve the delivery of and access to specialized mental health care. Currently, no meta-analytical evidence is available on IBIs for PTSD. We conducted a meta-analysis of 20 randomized controlled studies, including 21 comparisons, in order to summarize the current state of efficacy for the treatment of PTSD and to identify moderator variables. Studies tested internet-based cognitive behavioral therapy (CBT) and expressive writing (EW) against active or passive comparison conditions, including subclinical and clinical samples. Results show that at post-assessment CBT-IBIs are significantly more efficacious than passive controls, resulting in medium to large effects on the PTSD sum and all sub-symptom scores ($0.66 < g < 0.83$), but both EW and CBT are not superior to active controls. EW differed from controls only at follow-up in reducing intrusions and hyperarousal, but based on merely two studies. Subgroup analyses reveal that for CBT none of the program components such as provision of therapeutic support, reminders, or number of sessions serves as a moderator. Overall, results for CBT-IBIs are promising, but the number of includable studies for subgroup analyses was low, limiting statistical power. Future research is necessary to systematically investigate the impact of treatment components and test against active controls with optimal power.

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1. Introduction

1.1. Introduction to posttraumatic stress disorder

Around 65% of the world population experience at least one potentially traumatic event at some point during the lifespan (National Collaborating Center for Mental Health, 2005). A recent survey of the lifetime occurrence of posttraumatic stress disorder (PTSD) in the US adult population found prevalence rates of 11.7% in women and 4% in men (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). Depending on a number of risk factors such as an interpersonal nature of the traumatic event (Phelps et al., 2014), female gender (Kessler et al., 2012), repeated traumatic exposure for occupational reasons (e.g. Hoge et al., 2004; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), residency in an unstable political and economic country (de Jong, Komproe, Van Ommeren, et al., 2001; Keane, Marshall, & Taft, 2006), and being member of an ethnic minority (Ruwaard, Lange, Schrieken, & Emmelkamp, 2011), prevalence rates of lifetime PTSD have been found to vary between 5% and 55% (Terhakopian, Sinaii, Engel, Schnurr, & Hoge, 2008). In addition, due to repeated revisions of diagnostic criteria and a variety of available measures, reports on the prevalence of PTSD differ across studies despite comparable sample characteristics (Terhakopian et al., 2008).

Following the recently updated DSM-5 criteria (American Psychiatric Association, 2013), PTSD comprises four symptom clusters: (a) the

avoidance of external and internal stimuli that may trigger traumatic memories; (b) the *re-experiencing* of the traumatic event in the form of intrusive thoughts, nightmares or flashbacks; (c) *negative cognitions and mood*, which is characterized by senses of blame, guilt or shame, estrangement, withdrawal and the inability to experience or to express positive emotions; and (d) *alterations in arousal and reactivity (hyperarousal)*, that may lead to excessive alertness, aggressive behavior, recklessness, sleep disturbances, safety behavior and jumpiness. The previous version, DSM-IV-TR (American Psychiatric Association, 2013), on which most research is still based, includes three symptom clusters: avoidance, re-experiencing and hyperarousal.

1.2. Psychological treatment of posttraumatic stress disorder

Trauma-focused cognitive behavioral therapy (TF-CBT) combines well-established cognitive-behavioral techniques such as confrontation with trauma-associated stimuli (exposure in sensu or in vivo) with habituation and mental processing of the traumatic event as assumed mechanisms of change, and cognitive reappraisal, which specifically aims at the identification and modification of maladaptive cognitive distortions associated with PTSD. TF-CBT is the best evaluated approach for PTSD, resulting in the highest number of studies providing consistent evidence of efficacy with large effect sizes when compared to wait list or usual care (Bisson, Roberts, Andrew, Cooper, & Lewis,

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