



The efficacy of internet-delivered treatment for generalized anxiety disorder: A systematic review and meta-analysis



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ABSTRACT

Generalized Anxiety Disorder (GAD) is typically considered a chronic condition characterized by excessive worry. Lifetime prevalence is 4.3–5.9%, yet only a small percentage seeks treatment. GAD is treatable and in recent years internet-delivered treatment interventions have shown promise. This paper aims to systematically search for literature on internet-delivered psychological interventions for the treatment of GAD and conduct a meta-analysis to examine their efficacy. The purpose of the paper is to inform the community of researchers, program developers and practitioners in internet delivered interventions of the current state-of-the-art and research gaps that require attention. A systematic search of the literature was conducted to find all studies of internet-delivered treatments for GAD ($N = 20$). Using Review Manager 5 all Randomized Controlled Trials (RCTs; $n = 11$) that met our established eligibility criteria were included into a meta-analysis that calculated effect sizes via the standardized mean difference. Compared to the waiting-list controls, the results demonstrate positive outcomes for GAD symptoms ($d = -0.91$) and its central construct of pathological worry ($d = -0.74$). The meta-analysis supports the efficacy of internet-delivered treatments for GAD including the use of disorder-specific (4 studies) and transdiagnostic treatment protocols (7 studies). Caution is advised regarding the results as the data is limited and highly heterogeneous, but revealing of what future research might be needed.

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1. Introduction

Generalized Anxiety Disorder (GAD) is characterized by excessive anxiety and worry, which the sufferer describes as difficult to control, occurring more days than not for a period of at least six months (American Psychiatric Association [APA], 2013). Other symptoms of GAD include restlessness, being easily fatigued, difficulty concentrating, irritability, muscle tension, and sleep disturbance. GAD is one of the most prevalent anxiety disorders (Kessler et al., 2005a; Kessler et al., 2005b; Narrow et al., 2002). Its one-year prevalence in community samples in the US is around 3% and its lifetime prevalence around 5% (Blazer et al., 1991; Kessler et al., 2005a; Kessler et al., 2005b; Wittchen, 2002). Studies from other countries revealed roughly similar figures (Bijl et al., 1998; Faravelli et al., 1989; Hunt et al., 2002; Jenkins et al., 1997). GAD patients typically present in primary care settings, where the reported prevalence is up to 8% (Kroenke et al., 2007; Roy-Byrne & Wagner, 2004).

Evidence from retrospective accounts suggest that people with GAD will have their first episode by age 31, with a quarter having their first episode by age 20, with an early onset in childhood or adolescence

(Kessler et al., 2005a). Research suggests that GAD is a chronic and enduring condition (Angst & Vollrath, 1991; Grant et al., 2005). Furthermore, comorbidity is as high as 90%, with 70% being diagnosed with comorbid depression, over 55% with any other anxiety disorder and 48% with a somatoform disorder (Carter et al., 2001). Around 50% of patients with GAD have also a personality disorder, most commonly avoidant and dependent personality disorder (Sanderson et al., 1994). Depression is commonly shown to follow GAD (Kessler et al., 2004), suggesting that chronic GAD may start the onset of depression in some cases (Barlow, 2002).

People with GAD experience significant impairment in quality of life (Loebach Wetherell et al., 2004; Massion et al., 1993). GAD negatively impacts the individual's general sense of well-being and life satisfaction and specifically occupational and family satisfaction (Stein & Heimberg, 2004). GAD represents a significant cost to society due to disability, decreased work productivity and increased use of health care services (Wittchen, 2002).

2. GAD and its treatment

As is the case with other anxiety disorders, cognitive-behavioral therapy (CBT), a form of psychological therapy, is the treatment that is

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routinely considered for GAD (National Institute for Health and Clinical Excellence, 2011). CBT for GAD is well studied and is shown to be more effective than wait-list, non-specific control conditions or treatment as usual (Borkovec & Ruscio, 2001; Hunot et al., 2007; National Institute for Health and Clinical Excellence, 2011). Several cognitive-behavioral models of generalized anxiety disorder exist (Brown et al., 2001; Dugas & Robichaud, 2007). In general, these models assume that people with GAD had early experiences of uncontrollability (Brown et al., 2001) or have intolerance of uncertainty on the basis of negative belief (Dugas & Robichaud, 2007). The worry in GAD aims at avoiding future aversive events (Borkovec, 1994; Brown et al., 2001) which brings temporary relief, but also inhibition of emotional processing and maintenance of anxiety-producing thinking and behaviors (Brown et al., 2001). More cognitive and meta-cognitive models of GAD also stress positive beliefs about worry's protective function (Wells, 1999).

CBT for GAD includes a number of specific components such as cognitive restructuring, behavioral exposure to feared consequences, worry exposure (staying with feared outcomes), relaxation training, worry behavior prevention and problem solving (Borkovec & Ruscio, 2001; Brown et al., 2001; Covin et al., 2008; Dugas & Robichaud, 2007). Their main rationale is that the patient overcomes emotional avoidance and learns that anxiety is not debilitating, but manageable and recedes after time. Recently, transdiagnostic CBT protocols for depressive and anxiety disorders have been proposed that also focus on features relevant to GAD such as emotional avoidance (Barlow et al., 2011). Proponents of transdiagnostic interventions argue that the similarities between the anxiety disorders outweigh their individual differences and they can respond to common therapeutic procedures (Allen et al., 2007).

3. Access to treatment: the evolution of high and low-intensity interventions

Healthcare providers are increasingly faced with a discrepancy between the burden of mental health conditions and the availability of cost-effective psychological treatments (Kohn et al., 2004). It has been estimated that upwards of 70% of people with anxiety disorders go untreated every year (Andrews et al., 2001; Lepine, 2002). There are multiple barriers to accessing treatment, including waiting-lists, costs, distance from service locations, negative perception of treatments, and personal stigma (Kohn et al., 2004; Mohr et al., 2010).

In recent years a model of stepped-care has evolved, involving high-intensity (e.g., one-to-one therapy) and low-intensity (e.g., bibliotherapy, internet-delivered treatments) interventions (Bower & Gilbody, 2005). Low-intensity internet-delivered interventions have the potential to extend access and reduce costs and possibly can overcome some of the barriers mentioned above.

Several studies have reported positive outcomes for internet-delivered treatments for social phobia, spider phobia, flight and other phobias, panic disorder, obsessive-compulsive disorder (OCD), post-traumatic stress disorder (PTSD), stress-related anxiety, trauma, depression and generalized anxiety disorder (GAD) (Cuijpers et al., 2009; Reger & Gahm, 2009; Richards & Richardson, 2012).

Internet-delivered cognitive behavior therapy treatment protocols have included disorder-specific treatments and transdiagnostic treatments that aim to treat the common elements and symptoms for anxiety disorders in general (Andersson et al., 2012; Bell et al., 2012; Carlbring et al., 2011; Johnston, Titov, Andrews, Spence, & Dear, 2011; Newby et al., 2013; Paxling et al., 2011; Robinson et al., 2010; Titov et al., 2010; Titov et al., 2009; Titov et al., 2011). Few internet-delivered treatments have integrated other therapeutic practices such as brief psychodynamic therapy (Andersson et al., 2012).

4. Other reviews and meta-analyses

A number of reviews and meta-analyses of this area have been published. An early narrative review (Przeworski & Newman, 2006) of

technology-assisted CBT for anxiety concluded that the field was in its infancy but that existing research was promising and suggested that technology-based delivery may be efficacious and cost-effective. Reger and Gahm's (2009) meta-analysis concluded that the data supported the use of such delivery systems and that the results are superior to waiting-list or placebo. The study did not review any internet interventions for the treatment of GAD (Reger & Gahm, 2009); there simply were none published at the time. A similar meta-analysis by Cuijpers et al. (2009) found a large effect size ($d = 1.08$) for the active conditions compared to the controls. The authors concluded in favor of the potential of computer-aided delivery of treatments for anxiety disorders (Cuijpers et al., 2009). The meta did not include studies for generalized anxiety disorder. Andrews et al. (2010) published a meta-analysis demonstrating that computerized CBT was superior to outcomes from control groups. In an analysis of 22 studies of comparisons with a control group they reported a post-treatment effect size of $d = 1.12$ for the studies that examined GAD (Andrews et al., 2010).

To date, the data available for the relevance of internet-delivered treatments on outcomes specifically in GAD-diagnosed subjects is scarce. In recent years, principally using internet-delivery, other studies have been published. A recent meta-analysis by Cuijpers et al. (2014) examined the effectiveness of psychological therapy for GAD. While it included studies using internet interventions it was not their primary focus.

In 2013, Cochrane published a review of media-delivered cognitive behavior therapy and behavior therapy (self-help) for anxiety disorders in adults (Mayo-Wilson & Montgomery, 2013). Some of the studies in that review we include here also. The other studies they included for GAD are unpublished data from Kiely (2002), Houghton (2008), and Shoenberger (2008). They included Bowman (1997), but the media used was worksheets on paper (not computer or internet-delivered) and lastly Rosmarin (2010), which included a sub-clinical anxiety group, not GAD symptom-specific group. Their search period ended January 1 2013 and further ($n = 4$) studies have been published since that time. Similarly, Christensen et al. (2014) included a search period of 18 months from 2012 to June 2013 and included two studies for GAD, but since that time other studies have been published.

The current study therefore aimed to be more specific and systematically review and conduct a meta-analysis of internet-delivered psychological therapy for GAD compared to waiting-list control groups. The purpose of the paper is to inform the community of researchers, program developers and practitioners in internet-delivered interventions of the current state of the art and research gaps that require attention. The paper presents a comprehensive search of the literature, an effort to gather discrete data on subjects, and a detailed focus on the efficacy of internet interventions on GAD specific and some co-morbid (depression, distress, disability and quality of life) symptoms.

5. Method

5.1. Literature search and selection of studies

The aim of our literature search was to find all studies that related to internet-delivered treatment protocols for GAD, including disorder-specific protocols and more recent transdiagnostic protocols. During June 2013, we selected three prominent databases (Embase, PubMed, and PsychINFO including PsychARTICLES) as our search arena. After initial experimentation with several search phrases (online delivered treatments for anxiety/generalis[z]ed anxiety, web-based treatment/interventions for anxiety, among others) that were derived from the authors' experiences in internet-delivered treatments and also from known studies, we decided on the use of three key search phrases that we were confident would yield the relevant literature. They were 'internet treatment for generalized anxiety disorder' and 'internet treatment for generalized anxiety disorder' and 'internet treatment for anxiety'.

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