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Long-term outcomes and predictors of internet-delivered cognitive behavioral therapy for childhood anxiety disorders

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ABSTRACT

Objective: This study investigated the long-term outcomes of internet-delivered cognitive behavior therapy (ICBT) for children with anxiety disorders, and potential pre-treatment predictors of treatment outcome.
Method: The sample included eighty-four children (8–12 years old) with anxiety disorders, from both a treatment group and a waitlist control (after participants had crossed over to treatment) of a previous randomized controlled study. Participants were assessed at post-treatment and three- and twelve-months after treatment using a semi-structured interview and parent ratings. Pre-treatment data were used to investigate predictors of treatment outcome at three-month follow-up.
Results: Intention-to-treat analysis showed that treatment gains were maintained at twelve-month follow-up, including clinician rated severity of the principal anxiety disorder, parent rated anxiety symptoms and global functioning, with mainly large effect sizes (Cohen's d = 0.63–2.35). Completer analyses showed that suspected autism spectrum disorder was associated with less change in symptom severity. No other pre-treatment measures significantly predicted treatment outcome.
Conclusion: This study suggests that internet-delivered CBT can have long-term beneficial effects for children with anxiety disorders. Predictors of treatment outcome need to be evaluated further.
Trial registration: Clinicaltrials.gov; NCT01533402.

1. Introduction

Anxiety disorders among children are a prevalent and disabling problem, for which effective treatments, in the form of cognitive behavior therapy (CBT), exists (James, James, Cowdrey, Soler, & Choke, 2013; Pine & Klein, 2008, pp. 628–647). However, only a relatively small proportion of this diagnostic group receive care (Chavira, Stein, Bailey, & Stein, 2005; Costello, He, Sampson, Kessler, & Merikangas, 2014), with one possible explanation being a relative shortage of trained CBT-therapists (Stallard, Udwin, Goddard, & Hibbert, 2007). Internet-delivered cognitive behavior therapy (ICBT) could increase the availability of evidence-based treatments for children with anxiety disorders (Andersson, 2014). ICBT can be described as a therapist-guided self-help program, resembling guided bibliotherapy. Families can work independently at their own pace but still benefit from therapist support. Although ICBT has the potential to reach a large number of patients, there are several research questions remaining before widespread dissemination can be recommended for children. One is to explore if ICBT treatment gains are maintained over a long-term follow-up period. Another is to investigate for which children, or families, ICBT is most suitable by looking at potential predictors or moderators.

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1.1. Long-term outcomes

Assessments of long-term outcomes are an important step in examining the efficacy of a treatment. Compton et al. (2004) found that post-treatment gains were maintained at follow-up in most face-to-face studies. Similarly, studies on ICBT or therapist-guided bibliotherapy for children and adolescents with anxiety have shown that treatment gains from guided self-help are maintained or even improved during long-term follow-up periods between six and twelve months (Cobham, 2012; Lyneham & Rapee, 2006; March, Spence, & Donovan, 2009; Spence et al., 2011). However, these studies are all from Australia and, while the results are promising, there is still relatively little long-term outcome data available ($n < 300$). Thus, there is a need to replicate these results in other samples.

1.2. Potential predictors

There are at least two reasons why it is important to explore for whom ICBT is most suitable. The first is to improve efficacy and ensure that patients are not offered a treatment that is not likely to help them. The second pertains to clinicians' beliefs about ICBT, and for which patients they would be willing to recommend ICBT. When asked, clinicians express concerns regarding the efficacy and safety of ICBT for certain patients. For example, they are more reluctant to offer ICBT or computerized CBT for children and adolescents with more severe or complex problems (Stallard, Velleman, & Richardson, 2010; Vigerland et al., 2014). Investigation of outcome predictors in ICBT for children and adolescents could examine the validity of these concerns, and guide clinicians in their treatment choices.

To the best of our knowledge, no studies have yet investigated predictors for ICBT in children. However, predictors relevant to face-to-face CBT are also likely to be relevant for ICBT. In recent reviews of predictors in face-to-face CBT for children, symptom severity, comorbidity and parental psychopathology have inconsistently been shown to be significantly associated with treatment outcome (Knight, Hudson, McLellan, & Jones, 2014; Lundkvist-Houndoumadi, Hougaard, & Thastum, 2014). Similarly, the largest study on face-to-face CBT for children with anxiety to date, the CAMS-trial, found that lower severity on composite parent- and clinician-rated measures and lower ratings of caregiver strain was associated with better treatment outcomes (Compton et al., 2014). In a multi-site study by Hudson et al. (2015), including more than 1500 children, parent psychopathology and a comorbid mood or externalizing disorder were associated with poorer outcome. Children with a principal diagnosis of social anxiety disorder or specific phobia were found to improve less than children with a principal diagnosis of generalized anxiety disorder (GAD). Although there are many studies evaluating the efficacy of ICBT for adults with anxiety disorders (Hedman, Ljótsson, & Lindefors, 2012b), no predictors have consistently predicted treatment outcome (El Alaoui, Hedman, Ljótsson, & Lindefors, 2015; El Alaoui et al., 2013; Hedman et al., 2012a).

Other potential predictors could be considered based on some of the inherent challenges of the guided self-help format of ICBT. For example, parental psychopathology, comorbidity and comorbid autism spectrum disorder (ASD) could be relevant predictors of ICBT outcome. In guided ICBT, large responsibility is placed on the families and on the parent's capacity to act as the child's coach or therapist, and thus may be more vulnerable to parental psychopathology. Furthermore, families where children fulfill criteria for several anxiety disorders might find it hard to differentiate between disorders and to know what problems to focus on. Although child depressive symptoms has not previously been identified as a potential predictor of treatment outcome, it may be of more importance in self-help contexts where children's own motivation might play a larger role than in traditional face-to-face treatment (Lyneham & Rapee, 2006).

While conducting our ICBT studies (Vigerland et al., 2013, 2016), our clinical impression has been that children who present with ASD-symptoms at baseline assessment will not benefit fully from ICBT treatment. Children with ASD often have more complex problems and there could be other considerations to be made beyond the ones typically addressed in CBT for anxiety, which standardized ICBT does not include. Studies have also shown that children with comorbid ASD might not benefit as much from standard face-to-face CBT as typically developing children (Ung, Selles, Small, & Storch, 2014). Puleo and Kendall (2010) found that moderate levels of parent rated ASD-symptoms were associated with poorer treatment outcomes in individual CBT (but not in family-based CBT).

1.3. Aims

Our first aim of this study was to investigate the long-term (twelve-month) outcomes of ICBT through a follow-up on the sample from a previous randomized controlled study by our research group (Vigerland et al., 2016). The second aim was to explore potential predictors of treatment outcome, which, to the best of our knowledge, has not been examined previously in ICBT for children with anxiety disorders. Specifically, based on previous literature and clinical experience of ICBT, we wanted to investigate the following predictors: symptom severity, number of diagnoses, type of principal and comorbid diagnoses, child reported depressive symptoms, suspected ASD comorbidity, and parental psychopathology.

2. Method

2.1. Participants

Participants were self-referred families ($n = 84$) who had participated in our previous randomized controlled trial of ICBT for anxiety disorders (Vigerland et al., 2016). The families had a child aged 8–12 with a principal anxiety disorder of generalized anxiety disorder (GAD), panic disorder, separation anxiety, social anxiety disorder or specific phobia. Exclusion criteria included diagnosed neurodevelopmental disorder (e.g. autism or attention-deficit/hyperactivity disorder (ADHD)), severe depressive symptoms (defined as <20 on the Child Depression Inventory), and acute psychiatric disorders (e.g. psychosis, suicidal ideation). Previous psychological or pharmacological treatment was not an exclusion criterion, however, psychotropic medication had to have been stable for 3 months prior the treatment. A full account of inclusion and exclusion criteria and procedure can be found in Vigerland et al. (2016). In the study, families were randomized to either ICBT ($n = 46$) or a waitlist control ($n = 38$), which was subsequently crossed over to treatment. Of the children initially randomized to waitlist control, only those who still fulfilled diagnostic criteria for a principal anxiety disorder after the waitlist were included in this study. The study was approved by the regional ethics committee in Stockholm.

2.2. Assessments

2.2.1. Outcome measures

The primary outcome measure was the Clinician Severity Rating (CSR) derived from the Anxiety Disorder Interview Schedule Child and Parent version (ADIS C/P; Albano & Silverman, 1996). ADIS is a