Sudden gains in internet-based cognitive behaviour therapy for severe health anxiety

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Objective: A sudden gain is defined as a large and stable individual improvement occurring between two consecutive treatment sessions. Sudden gains have been shown to predict better long-term improvement in several treatment studies, including cognitive behavioural therapy for depression and anxiety disorders, but have not been studied in the treatment of health anxiety or any form of internet-based cognitive behavioural therapy. The aim of this study was to investigate the role of sudden gains in internet-based cognitive behavioural therapy for severe health anxiety.

Method: We examined the occurrence and significance of sudden gains in measures of health anxiety in 81 participants receiving internet-based cognitive behavioural therapy. We compared patients with sudden gains, patients without sudden gains, and patients with gradual gains.

Results: Thirteen participants (16%) experienced one sudden gain in health anxiety with individual sudden gains distributed across the treatment. As expected, patients with a sudden gain showed larger improvements than patients without a sudden gain at post-treatment (d = 1.04) and at one-year follow-up (d = 0.91) on measures of health anxiety.

Conclusions: Consistent with previous studies, sudden gains in internet-based cognitive behavioural therapy are associated with significantly larger and stable treatment effects up to one-year follow-up.

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Severe health anxiety or hypochondriasis is characterized by a persistent and debilitating fear of developing serious somatic disease based on misinterpretation of benign bodily sensations (American Psychiatric Association, 2000). The disorder is common in health care contexts, increases the risk of developing major depression, follows a chronic course, and is associated with long-term functional impairment (Barsky, Fama, Bailey, & Ahern, 1998; Barsky, Wyshak, Klerman, & Latham, 1990; Faravelli et al., 1997). In DSM-5, hypochondriasis has been replaced by somatic symptom disorder and illness anxiety disorder (American Psychiatric Association, 2013) and the findings of the present study are thus mostly relevant for these DSM-5 disorders.

Cognitive behaviour therapy (CBT) has been shown to be an effective treatment for severe health anxiety and has the best empirical support among the psychological treatments (Clark et al., 1998; Greeven et al., 2007; Seivewright et al., 2008; Speckens et al., 1995; Warwick, Clark, Cobb, & Salkovskis, 1996). Findings from meta-analyses and systematic reviews indicate that internet-based CBT for anxiety and depressive disorders can be effective (e.g. Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Hedman, Ljótsson, & Lindefors, 2012), even when administered in routine clinical settings (e.g. Hedman, Ljótsson, Rück, et al., 2013). However, additional efficacy data are needed.
A recent randomized controlled trial of clinician guided internet-based CBT achieved large effects for treating severe health anxiety, similar to effect sizes obtained with conventional CBT (Reference omitted to enable masked review). In short, the treatment comprised online bibliotherapy with therapist support through an online messaging system resembling email (Andersson, 2009). The hypothesized mechanism of change of internet-based CBT is similar to face-to-face CBT as described by Furer and Foa (2005). It also shares similarities to CBT for obsessive compulsive disorder and panic disorder (Barlow, 2002; Franklin & Foa, 2011). The main treatment component includes exposure to health anxiety-related stimuli and response prevention. Specifically, clients engage in exposures to illness-related thoughts while discouraging reassurance seeking behaviours upon detection of perceived threatening bodily sensations.

It has been shown that improvement during CBT for depression typically follows a non-linear course with occasional sudden gains (Aderka, Nickerson, Boe, & Hofmann, 2012; Hayes, Laurenceau, Feldman, Strauss, & Cardaciotti, 2007; Tang and DeRubeis (1999) defined a sudden gain (SG) as unusually large improvements from one session to another. An SG is defined by criteria. 1) An SG must meet an absolute criterion, reflecting a large improvement in reference to the ‘global’ overall improvement from pre to post-treatment; in most publications, a reduction of ≥1 SD of this overall improvement has been used (i.e. at least seven points on the Beck Depression Inventory in Tang & DeRubeis, 1999). 2) An SG must also meet a relative criterion showing more than 25% improvement from one session to another. 3) Finally, an SG has to meet a stability criterion that is the scores of the three sessions preceding the SG have to be significantly higher than three sessions following it.

In their analysis (Tang & DeRubeis, 1999), SGs occurred in 39% of persons treated with CBT for depression in two randomized controlled trials. Interestingly, SGs were strongly associated with larger improvements throughout the overall course of treatment, accounting for more than half of the outcome variance (Tang & DeRubeis, 1999). In an effectiveness study comparing sudden gainers to gradual gainers (i.e. those making the same improvement in absolute and relative terms but not between consecutive sessions), it was found that patients with an SG were significantly more improved than the gradual gainers (Greenfield, Gunthert, & Haaga, 2011). This suggests that the suddenness in itself is a central phenomenon.

Aside from CBT for depression, SGs have also been shown to be a common feature in CBT for social anxiety disorder (Hofmann, Schulz, Meuret, Moscovitch, & Suvak, 2006), panic disorder (Clerkin, Teachman, & Smith-Janik, 2008), and generalized anxiety disorder (Present et al., 2008), and obsessive-compulsive disorder (Aderka et al., 2012). A recent meta-analytic review investigating the effect of SGs for depression and anxiety disorders showed that the between-group effect size of individuals with vs. without SG was moderate to large (Hedges’ g = 0.62) on primary outcomes (Aderka, Nickerson, et al., 2012). It also showed that SGs occur regularly in CBT and the authors concluded that the phenomenon is non-transient and linked to better outcomes at post-treatment as well as longer-term follow-up (Aderka, Nickerson, et al., 2012).

The seminal paper by Tang and DeRubeis (1999) reported that SGs were preceded by a cognitive change in the pregain session, thus supporting a cognitive meditational hypothesis. However, other studies did not find that cognitive changes precede SGs (Andrusyna, Luborsky, Pham, & Tang, 2006; Hofmann et al., 2006). It also seems that SGs can occur as often in exposure-based treatments as in cognitive treatments, suggesting that specific interventions aimed directly at altering thought processes are not necessary for the large and sudden improvement that an SG constitutes (Hofmann et al., 2006). Doane, Feeny, and Zoellner (2010), investigating SGs in a treatment focussing on exposure and response prevention for PTSD, found that 53% of participants experienced SGs, demonstrating that behavioural interventions with little emphasis on directly altering cognitions can produce non-linear sudden improvements on the same scale as treatments based on cognitive interventions. So far, no study has examined SGs in CBT for severe health anxiety or compared internet-based and face-to-face treatment modalities of the same CBT approach.

The aim of the present study was to investigate SGs in internet-based CBT for severe health anxiety with a focus on exposure and response prevention. We hypothesized that the proportion of persons with SG would be in the same range as in CBT for other anxiety disorders and that persons who experienced an SG would make larger short- and long-term improvements than those who did not.

**Design**

This study employed a within group design with repeated measurements using a sample of participants (N = 81) that received treatment within the context of a randomized controlled trial (RCT). Half the sample was crossed over to treatment after 12 weeks being on a waiting list with access to an online discussion forum. There were no significant group differences between participants receiving immediate vs. delayed treatment in terms of sociodemographic variables and psychiatric symptoms.

All randomized participants were included in this study. Assessments were conducted before (pre-treatment), immediately after treatment (post-treatment), six months post-treatment (6MFU), and one year post-treatment (1YFU). During the treatment phase, the primary outcome measure was administered on a weekly basis. Diagnostic interviews were performed by experienced licenced clinical psychologists at pre- and post-treatment. Participants were classified as sudden gainers or non-sudden gainers, the latter group comprising gradual gainers and non-gainers. A detailed description of classification criteria is provided below. The main outcome study has been reported elsewhere (Hedman et al., 2011; Hedman, Andersson, et al., 2013).

**Sample and main inclusion criteria**

The sample comprised 60 women (74%) and 21 men (26%) with a mean age of 39.0 (SD = 9.7) years. On average, participants had suffered from severe health anxiety for 21.0 (SD = 13.2) years. Of the 81 participants, 70 (86%) were married or in a stable long-term relationship and 54 (67%) had children. A more detailed overview of the characteristics of the sample is presented in Table 1. The study was conducted in a university hospital setting in Stockholm, Sweden and treatments were delivered at a unit specializing in internet-based CBT. That is, the researchers conducting the study and the psychologists delivering the treatments were employed at this unit, but participants accessed the treatment from their home and did not have any appointments at the unit during the treatment. Participants could apply through self-referral or referral from primary or psychiatric care. Informed consent was obtained from all participants and the study was approved by the regional ethics review board in (location omitted to enable masked review).

To be included in the study, participants had to meet the following criteria: (a) have a principal diagnosis of severe health anxiety, i.e. hypochondriasis, according to DSM-IV-TR (American Psychiatric Association, 2000), (b) agree not to undergo any other psychological treatment for the duration of the study, (c) have no history of psychosis or bipolar disorder, and (d) have a constant dosage two months prior to treatment if on prescribed medication for anxiety or depression and agreed to keep dosage constant throughout the study.
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