



The mediating effect of mindful non-reactivity in exposure-based cognitive behavior therapy for severe health anxiety



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ABSTRACT

Exposure-based cognitive behavior therapy (CBT) has been shown to be effective in the treatment of severe health anxiety, but little is known about mediators of treatment effect. The aim of the present study was to investigate mindful non-reactivity as a putative mediator of health anxiety outcome using data from a large scale randomized controlled trial. We assessed mindful non-reactivity using the Five Facets Mindfulness Questionnaire-Non-Reactivity scale (FFMQ-NR) and health anxiety with the Short Health Anxiety Inventory (SHAI). Participants with severe health anxiety ($N = 158$) were randomized to internet-delivered exposure-based CBT or behavioral stress management (BSM) and throughout the treatment, both the mediator and outcome were measured weekly. As previously reported, exposure-based CBT was more effective than BSM in reducing health anxiety. In the present study, latent process growth modeling showed that treatment condition had a significant effect on the FFMQ-NR growth trajectory (α -path), estimate = 0.18, 95% CI [0.04, 0.32], $p = .015$, indicating a larger increase in mindful non-reactivity among participants receiving exposure-based CBT compared to the BSM group. The FFMQ-NR growth trajectory was significantly correlated with the SHAI trajectory (β -path estimate = -1.82 , 95% CI [-2.15 , -1.48], $p < .001$). Test of the indirect effect, i.e. the estimated mediation effect ($\alpha\beta$) revealed a significant cross product of -0.32 , which was statistically significant different from zero based on the asymmetric confidence interval method, 95% CI [-0.59 , -0.06]. We conclude that increasing mindful non-reactivity may be of importance for achieving successful treatment outcomes in exposure-based CBT for severe health anxiety.

1. Introduction

Core features of severe health anxiety, in this paper defined as DSM-IV hypochondriasis American Psychiatric Association (1994), are a persistent fear of developing serious somatic disease, and misinterpretation of benign bodily sensations. Severe health anxiety is highly prevalent in medical settings, associated with functional disability and rarely remits if untreated (Barsky, Fama, Bailey, & Ahern, 1998; Sunderland, Newby, & Andrews, 2013; Tyrer et al., 2011). In the last 20 years, there has been a rapid development in psychological treatment of the disorder and several randomized controlled trials have shown that cognitive behavior therapy (CBT) is highly effective in reducing health anxiety (Olatunji et al., 2014).

Our research group has developed an exposure-based CBT protocol (Hedman et al., 2011; Hedman, Axelsson, Andersson, Lekander, & Ljótsson, 2016b; Hedman et al., 2014), which assumes that severe

health anxiety is perpetuated by the avoidance of health anxiety-eliciting stimuli. The main component of the treatment is therefore systematic exposure to such stimuli, which may be both external (e.g., hospitals) and internal (e.g., a pounding heart or an intrusive thought about becoming ill). As a means to increase the willingness to undergo exposure, which is often highly anxiety-provoking, the treatment also includes mindfulness training. Mindfulness training is used solely as a means to increase the effect of exposure; not as a stand-alone intervention as in the mindfulness-based treatment for health anxiety developed by McManus, Surawy, Muse, Vazquez-Montes, and Williams (2012). As one part of mindfulness involves observing internal events without attempting to change their form (e.g. Kabat-Zin, 1994), we regarded it as potentially useful for persons with severe health anxiety when conducting exposure. The treatment has been shown to be effective in three randomized controlled trials and has demonstrated cost- and long-term effectiveness (Hedman et al., 2013b; Hedman, Andersson, Ljótsson,

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son, Axelsson, & Lekander, 2016a; Hedman et al., 2011, 2014). In these trials, exposure-based CBT was administered as a therapist-guided Internet-delivered treatment. This delivery model confers several advantages such as increased treatment accessibility and high control over the treatment content to which the patient is exposed (Hedman, Ljótsson, & Lindfors, 2012).

Despite the strong empirical support for CBT in the treatment of severe health anxiety studies investigating mediators, potential treatment mechanisms, are scarce. As stated by Kraemer, Wilson, Fairburn, and Agras (2002) studying mediators is one of the central questions of modern psychiatry as it can lead to development of more effective treatments or to treatments that have similar effectiveness but at a lower cost.

Only a handful studies have examined potential mediators in treatment studies for health anxiety. In a recent study that employed a design where the putative mediator and outcome were assessed before and after treatment, Weck, Neng, Schwind, and Hofling (2015a) demonstrated that reduction of dysfunctional attributions of somatic symptoms mediated treatment effect in both exposure-based and cognitive therapy. Based on data from the same trial, the same research group also found that therapist competence was associated with outcome and that this relationship was mediated by therapeutic alliance (Weck, Richtberg, Jakob, Neng, & Hofling, 2015b). In a non-clinical sample Olatunji, Etzel, Tomarken, Ciesielski, and Deacon (2011) showed that increasing safety behaviors led to increased health anxiety and that this effect was mediated by changes in health-related thoughts.

A potential explanation for the lack of mediation studies is that high methodological quality requires that both the mediator and the outcome are assessed frequently with tight intervals during the treatment so that individual differences can be adequately modeled to avoid biased longitudinal mediation effects (e.g. Maxwell & Cole, 2007; Maxwell, Cole, & Mitchell, 2011). In the field of severe health anxiety, we have only found one study meeting those criteria. In that study the findings showed that reduced perceived risk of disease, less attention to bodily symptoms and reduced intolerance of uncertainty mediated improvement in health anxiety in exposure-based CBT (Hedman et al., 2013a). As the investigated treatment was exposure-based these processes were only to a limited extent directly targeted, i.e., they were most likely changed as a consequence of exposure, which led to improvement in health anxiety. Because the treatment entails mindfulness training as a means to enhance exposure, we viewed it as important to investigate increased mindfulness as a putative mediator of improvement in exposure treatment.

A specific facet of mindfulness that, to our knowledge, has not been previously studied as a mediator in the context of exposure-based CBT for health anxiety is mindful non-reactivity. Mindful non-reactivity is a core aspect of mindfulness and refers to the process of observing thoughts, emotions and bodily sensations without reacting to them (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). For several reasons, the potential mediating role of mindful non-reactivity in exposure-based CBT is highly relevant to investigate. First, as reported by Muse, McManus, Hackmann, Williams, and Williams (2010) health anxiety is marked by intrusive thoughts of life-threatening illness and death and these thoughts serve as cues for checking behaviors, avoidance and distraction. As intrusive thoughts are future-oriented and hard to disconfirm directly, the authors suggest that mindfulness training is a logical treatment component as it could be a means to change the function rather than the form of the intrusions (Muse et al., 2010). Second, as exposure and response prevention by definition means staying in contact with an aversive stimulus while refraining from avoidance or control behaviors (Barlow, Allen, & Choate, 2004) it is highly likely that there will be positive feedback loops between mindfulness training, exposure exercises and mindful non-reactivity. One of several possibilities is that mindfulness training leads to an increased capacity for mindful non-reactivity, which increases the

chance of conducting successful exposure and response prevention, which in turn further strengthens the person's ability to observe without reacting, and so forth. This is in line with empirical studies that have shown that mindfulness is associated with increased willingness to conduct exposure (Arch & Craske, 2006; Arch & Craske, 2010). Third, as postulated by theorists, the process of being mindful could not only increase fear tolerance but in itself be viewed as exposure to multiple conditioned stimuli such as physical sensations, emotions, and cognitions (Treanor, 2011), which may in part explain the effect of mindfulness-based treatments for anxiety disorders. Fourth, two previous studies based on clinical trials of treatment for health anxiety showed that mindfulness processes mediated the effect in mindfulness-based cognitive therapy (McManus et al., 2012) and Acceptance and Commitment Therapy (ACT) (Eilenberg, Hoffmann, Jensen, & Frostholm, 2017), respectively.

Although the Five Facet Mindfulness Questionnaire (FFMQ) (Baer et al., 2006), which is probably the most widely used measure of mindfulness processes, is comprised of not just non-reactivity but also of facets relating to for example *acting with awareness*, *observing*, and *describing* not all of these processes might be equally important when it comes to explaining effects of exposure treatment for health anxiety. We viewed mindful non-reactivity a specifically relevant potential mediator in this context. This is because it is plausible that non-reactivity, for which a typical item of the FFMQ reads “Usually when I have distressing thoughts and images, I just notice them and let them go”, is important when one is deliberately aiming to stay in contact with aversive internal events, i.e., when conducting systematic exposure. In contrast, the other facets of mindfulness as assessed with the FFMQ, which have items such as “I notice the smells and aromas of things” (observing) and “I find myself doing things without paying attention” (acting with awareness), were judged to be of less potential relevance in the context of exposure therapy. For this reason, we decided to collect mediation data using only the non-reactivity subscale of the FFMQ and not the other subscales. Also, a recent study investigating mediation in ACT for health anxiety using the full FFMQ found that mindful non-reactivity, but not the other facets of FFMQ, significantly mediated improvement (Eilenberg et al., 2017), thus indicating that non-reactivity is a mindfulness process of special importance in health anxiety treatment. As noted above, gaining more knowledge about mindful non-reactivity as a potential mediator could provide new valuable information on how to improve psychological treatment for severe health anxiety.

The aim of this study was to investigate mindful non-reactivity as a putative mediator in exposure-based CBT for severe health anxiety. The study was conducted in the context of a randomized controlled trial using an active control condition that received behavioral stress management (BSM). Treatments were delivered via the Internet and the main outcome study showed that, compared to BSM, exposure-based CBT led to superior reductions in health anxiety (Hedman et al., 2014). We expected that improvements in health anxiety would be mediated by mindful non-reactivity, that there would be a significant effect of treatment (CBT vs. BSM) on the mediator (α -path), a significant effect of the mediator on the outcome (β -path), and a significant indirect mediational effect ($\alpha\beta$).

2. Method

2.1. Design

This was a mediation study based on data from a clinical trial where adult participants with severe health anxiety ($N = 158$) were randomized to Internet-delivered exposure-based CBT ($N = 79$) or BSM ($N = 79$) in a 1:1 ratio without restriction. As reported previously (Hedman et al., 2014) both treatments were 12 weeks long and the study was conducted in Stockholm, Sweden. Participants provided informed consent and the study was approved by the Regional Ethics

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