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Mechanisms of change in cognitive behaviour therapy for panic disorder: The role of panic self-efficacy and catastrophic misinterpretations

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ABSTRACT

The efficacy of cognitive behavioural therapy (CBT) for panic disorder with or without agoraphobia (PD) is well-established; however, little is known about the underlying change processes of clinical improvement during therapy. According to cognitive theories, CBT for PD primarily works by changing catastrophic misinterpretations of bodily symptoms and panic attacks. However, panic self-efficacy, i.e. the perceived ability to cope with panic attacks, has also been suggested as an important change mechanism in CBT for PD. The aim of the study was to investigate if change in catastrophic misinterpretations and panic self-efficacy mediated change in the level of anxiety during the course of thirteen sessions of group CBT for PD. Forty-five participants completed weekly self-report measures of the possible cognitive mediators and the level of anxiety throughout therapy. The results indicated that within-person change in panic self-efficacy in one session, but not in catastrophic misinterpretations, predicted within-person level of anxiety symptoms the following week. However, in a reversed analysis, prior change in level of anxiety symptoms also predicted change in panic self-efficacy the following session. These results support panic self-efficacy as a mediator of change in CBT for PD, although a reciprocal causal relationship between panic self-efficacy and level of anxiety seems to be implied.

Introduction

Psychological treatment of panic disorder with or without agoraphobia (PD) has been highly influenced by the cognitive models of Beck (Beck, Emery, & Greenberg, 1985) and Clark (Clark, 1986). According to Clark's widely acknowledged model of PD, the disorder is primarily maintained by catastrophic misinterpretations of ambiguous bodily sensations or mental events (e.g. a pounding heart is interpreted as a sign of a heart attack, and a feeling of unreality is interpreted as a sign of impending insanity), also referred to as catastrophic beliefs. Correspondingly, cognitive behavioural therapy (CBT) is supposed to work primarily by changing such catastrophic beliefs, thereby creating positive feedback loops of more realistic interpretations of bodily symptoms, and leading to an overall decrease in anxious arousal and bodily symptoms (e.g. Austin & Richards, 2001; Clark, 1994; Clark, 1996). In another influential theory of PD, Barlow (1988) emphasised the individual's perception of low emotional control or coping as a central component in the aetiology and maintenance of PD and anxiety disorders in general. Inspired by Beck et al. (1985), Casey, Oei, and Newcombe (2004) pointed out that pathological anxiety could be considered a result of both an appraisal of situations and internal events as threatening, and the individual's perception of lack of resources to cope with the perceived danger. Casey, Oei, and Newcombe (2004) referred to the individual's perceived ability to cope with panic attacks as "panic self-efficacy". According to Casey et al., catastrophic misinterpretations, as well as a lack of panic self-efficacy, are assumed to play key roles, both in the aetiological development of PD and in the mechanisms of change in CBT for PD. The two mechanisms could interact, in that individuals who do not

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believe they have the ability to cope with a perceived threat (low panic self-efficacy), could be more prone to experience catastrophic misinterpretations of anxiety symptoms and anxious arousal. In contrast, the presence of high panic self-efficacy could assist the individual in disconfirming his/her catastrophic misinterpretations of threatening bodily symptoms (Borden, Clum & Salmon, 1991). Correspondingly, a convincing disconfirmation of the individual's catastrophic misinterpretations of bodily symptoms or mental events could make it easier to tolerate and believe in own resources to perform adequately in future similar situations (Casey, Oei, Newcombe & Kenardy, 2004; Hoffart 1995b).

To date, the individual's catastrophic misinterpretation of bodily symptoms has been the most thoroughly examined factor both in relation to aetiological models of PD and to mechanisms of change in CBT for PD. A considerable amount of experimental studies have supported the assumption of an individual's catastrophic misinterpretation of bodily symptoms as a key factor in the development and experience of anxiety in both healthy individuals and individuals with PD (e.g. Clark, 1993; Clark et al., 1997; Gregor & Zvolensky, 2008; Rapee & Medoro, 1994). Also, a substantial number of studies with pre- and post-treatment measurement have shown that reductions in catastrophic misinterpretations are associated with symptom improvement in CBT for PD (Hoffart, Sexton, Hedley & Martinsen, 2008; Smits, Power, Cho & Telch, 2004; see extensive reviews e.g. Clark, 1999; Khawaja & Oei, 1998; Oei, Llamas & Devilly, 1999). Furthermore, a few CBT studies, with at least three measurement time points, necessary to infer a temporal precedence of the mediator to the outcome, supported catastrophic cognitions as mediators of change in PD (Hoffart, 1998; Hofmann et al., 2007; Meulenbeek, Spinhoven, Smit, Van Balkom & Cuijpers, 2010). However, none of these studies included repeated assessment points during therapy but only at pre-, post-treatment, and follow-up. Overall, a large body of empirical evidence has supported Clark's central assumption that reductions in anxiety-related symptoms will occur because of change in catastrophic misinterpretations.

There is also some evidence indicating that panic self-efficacy is involved in the mechanism of PD (e.g. Rapee, 1995; Schmidt, Eggleston, Trakowski & Smith, 2005; Schmidt, Trakowski & Staab, 1997). However, only few studies have investigated the role of panic self-efficacy in the processes of change in CBT for PD. Bouchard et al. (1996), Hoffart (1995b), and Starcevic, Latas, Kolar & Berle (2007) investigated amount of change in panic self-efficacy from pre- to post-treatment without examining its association with change in anxiety symptoms, whereas Casey, Newcombe, and Oei (2005) investigated the association between pre-post change in panic self-efficacy (as well as in catastrophic beliefs) and change in outcome in CBT for PD.

Only few studies examining change processes in the treatment for PD have used a repeated measures design recommended by Kazdin (2007) as the optimal design for studying mediators in psychotherapy. However, in two recent studies catastrophic beliefs were repeatedly measured through CBT for PD. Teachman, Marker and Smith-Janik (2008) showed that changes in the individual's maladaptive fear schema (a concept related to catastrophic beliefs) measured five times over a twelve-week course of therapy significantly predicted subsequent change in overall panic disorder severity during therapy. Furthermore, a reversed relationship between the maladaptive fear schema and outcome over the course of therapy was examined, but not supported. Teachman, Marker and Clerkin (2010) also found that changes in catastrophic misinterpretations of bodily symptoms predicted subsequent changes in various symptom domains and overall panic severity. However, a reversed relationship of outcome and catastrophic misinterpretations was generally not supported.

Studies on panic self-efficacy in CBT for PD using a repeated measures design have generally also included catastrophic misinterpretations. One study of Bouchard et al. (2007) measured the two cognitive variables daily as predictors of outcome over thirty weeks. The results showed temporal precedence of change in either catastrophic beliefs in three cases, panic self-efficacy in six cases, or both of the cognitive factors in the remaining three cases, to change in panic apprehension. Another study by Meuret, Rosenfield, Seidel, Bhaskara and Hofmann (2010) also measured perceived control over aversive events (i.e. the Anxiety Control Questionnaire of Rapee, Craske, Brown & Barlow, 1996) and catastrophic cognitions five times during CBT; however, the outcome measure of overall PD severity was only measured at pre- and post-treatment. The results indicated that change in both cognitive factors preceded change in overall PD severity, although they also found a bidirectional relationship. Further analyses of the relationship between the proposed mediators neither indicated a significant relationship between changes in catastrophic cognitions to later change in perceived control, nor the reversed relationship.

In summary, a substantial amount of studies have supported the association between cognitive factors and clinical outcome in CBT for PD, however the research concerning the role of cognitive factors in the process of change during CBT remains inconclusive. This is mainly due to the limited number of studies establishing a proper timeline over the course of therapy. Without documentation of temporal precedence of change in the proposed mediator to change in outcome, no firm conclusion can be drawn as to direction of causality (Kazdin, 2007; Kazdin & Nock, 2003). Furthermore, although longitudinal and multilevel data are collected with the primary goal of assessing within-person associations, they also provide information about cross-sectional, between-person associations. Recently, longitudinal models of change have been introduced which include the strength to disaggregate the between-person and within-person component of the predictors (Curran & Bauer, 2011; Hoffman & Stawski, 2009). The present study used repeated measurement of both predictors and outcome throughout therapy, and a proper separation of the between-person and within-person effects was taken into account. Such a strategy makes possible a more exact evaluation of the process of within-person change of the proposed predictors and outcome during therapy (Curran & Bauer, 2011).

The primary aims of the present study were to investigate the role of catastrophic beliefs and panic self-efficacy in the process of change in group CBT for PD using longitudinal data and multilevel analysis with proper methods of disaggregating the within-person and between-person components of the time-varying predictors. We hypothesized that within-person change in both catastrophic beliefs and panic self-efficacy mediated the within-person change in anxiety symptoms over the course of therapy, with no pre-assumptions about their relative importance. We further examined if between-person pre-treatment levels of the cognitive variables predicted change in anxiety symptoms, or moderated the relationship between the proposed mediators and anxiety symptoms across sessions.

Material and methods

Participants

We consecutively recruited forty five participants from the specialised Clinic for Anxiety Disorders, Aarhus University Hospital in Risskov, Denmark, between January 2008 and August 2010. Due to the referral procedures during the inclusion period (either from the general practitioner due to missing effect of previous