The mediational role of panic self-efficacy in cognitive behavioral therapy for panic disorder: A systematic review and meta-analysis

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ABSTRACT

Cognitive models of panic disorder (PD) with or without agoraphobia have stressed the role of catastrophic beliefs of bodily symptoms as a central mediating variable of the efficacy of cognitive behavioral therapy (CBT). Perceived ability to cope with or control panic attacks, panic self-efficacy, has also been proposed to play a key role in therapeutic change; however, this cognitive factor has received much less attention in research. The aim of the present review is to evaluate panic self-efficacy as a mediator of therapeutic outcome in CBT for PD using descriptive and meta-analytic procedures. We performed systematic literature searches, and included and evaluated 33 studies according to four criteria for establishing mediation. Twenty-eight studies, including nine randomized waitlist-controlled studies, showed strong support for CBT improving panic self-efficacy (criterion 1); ten showed an association between change in panic self-efficacy and change in outcome during therapy (criterion 2); three tested, and one established formal statistical mediation of panic self-efficacy (criterion 3); while four tested and three found change in panic self-efficacy occurring before the reduction of panic severity (criterion 4). Although none of the studies fulfilled all of the four criteria, results provide some support for panic self-efficacy as a mediator of outcome in CBT for PD, generally on par with catastrophic beliefs in the reviewed studies.

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Introduction

Over the last decades, substantial research has demonstrated that cognitive behavioral therapy (CBT) is an effective treatment for panic disorder (PD) with or without agoraphobia (e.g. Hofmann & Smits, 2008; Norton & Price, 2007; Stewart & Chambless, 2009). Although CBT's efficacy for PD is well-documented, research on mechanisms of change has been scarce and we know little about how and why such treatment works (Kazdin, 2007). Studies on change processes in psychotherapy most often focus on so-called mediator variables or mediators. A mediator is an intervening variable that statistically accounts for the relationship between the independent variable (e.g. CBT) and the dependent variable (e.g. panic symptom severity; Kazdin, 2007). Establishing statistical

mediation, however, does not determine whether the mediating variable *causes* therapeutic change. To test a causal relation between mediator and outcome requires establishing a timeline of change in the proposed mediator and therapeutic outcome over the course of therapy (i.e. that change in the proposed mediator precedes change in the outcome variable). Manipulating the assumed mediators in experimental designs may also prove a causal relation between mediator and outcome (Kazdin & Nock, 2003; Kraemer, Wilson, Fairburn, & Agras, 2002). To examine the specificity of a proposed mediator, Kazdin (2007) recommends including alternative theoretically derived mediators in mediational studies, thereby providing stronger support for the relation between the putative mediator and outcome.

Understanding change processes in CBT for PD is important since it can lead to prioritizing effective treatment components and methods, as well as augmenting treatment for the still large group of non-responders (Landon & Barlow, 2004). Knowing multiple change processes could clarify idiosyncratic pathways to change, and lead to more effective, individually tailored treatment.

Major theories of mechanisms of change in CBT for PD include the cognitive theories of Beck and Clark (Beck, Emery, & Greenberg, 1985; Clark, 1986), and anxiety control theories developed by Barlow (1988). In his widely recognized model of PD, Clark finds the most important factor to be the tendency to catastrophically misinterpret innocuous bodily symptoms or mental events (e.g. that a pounding heart may indicate a heart attack; or a feeling of unreality may mean one is about to lose control or going insane) (Clark, 1997; 1999). These misinterpretations lead to a vicious cycle of escalating anxiety and bodily symptoms, ultimately resulting in a panic attack. CBT for PD disconfirms the catastrophic beliefs and substitutes them with more realistic interpretations of the threatening stimuli, reducing the intensity of anxiety, and breaking the vicious cycle of panic attacks (e.g. Austin & Richards, 2001; Clark et al., 1999).

Anxiety control theories stress the individual's perceived lack of control or inability to cope with anxiety-related bodily symptoms and anxiety-provoking situations as an important determinant for the development and maintenance of PD as well as anxiety disorders in general (Barlow, 1988, 2002). Inspired by Lazarus' (1966) appraisal theory, Beck et al. (1985) considered anxiety a result of both an appraisal of situations as dangerous, and a perceived lack of ability to cope with the assumed dangers. Casey, Oei, and Newcombe (2004) explicitly applied Beck and Emery's conception into an integrated theoretical model of PD. They find that perceived lack of ability to cope with panic and catastrophic beliefs about danger play key roles in the development of PD as well as in the mediation of therapeutic change in CBT for PD. They refer to the individual's perceived ability to control or cope with perceived dangers in relation to panic attacks as "panic self-efficacy" (Casey, Oei, et al, 2004, p. 326). For individuals with PD, perceived dangers may comprise both external and internal events. Similarly, panic self-efficacy may include two subdimensions: a) perceived ability to perform a certain action within a feared (agoraphobic) situation, and b) perceived ability to control, discount, or cope with negative internal states such as feelings of panic, anxiety-related bodily symptoms, or negative thoughts (Mineka & Thomas, 1999; Zane & Williams, 1993).

Barlow (1988) suggests that the concepts of perceived control and self-efficacy in relation to panic are overlapping constructs, and that "it may be possible to extend self-efficacy theory to include performance capabilities in dealing with intense anxiety and panic" (p. 298). Bandura's (1988) theory of self-efficacy ascribes a primary role to perceived self-efficacy in coping with panic in mediating panic symptom reduction, and sees changes in catastrophic beliefs as an effect of change in panic self-efficacy. According to Bandura (1997), perceived self-efficacy may determine whether individuals will initiate appropriate coping behavior in a feared situation rather than safety behavior or avoidance, how hard they will try, and how long they will sustain their effort in the face of obstacles and aversive experiences such as anxiety. Thus, panic self-efficacy seems important for an individual's motivation and willingness to engage in challenging new behavior. For instance, it could lead to a more adaptive interpretation of anxiety-provoking situations, thereby increasing one's willingness to expose oneself to them. In therapy, this could be critical in achieving new learning experiences, reducing the severity of anxiety, and improving the individual's ability to cope adequately in future similar situations (Bandura, 1997; Bandura & Locke, 2003).

Although, panic self-efficacy or anxiety control has a long tradition in theories of PD etiology and mechanisms of change, it has been less thoroughly researched than catastrophic beliefs (Oei, Llamas, & Devilly, 1999; Smits, Julian, Rosenfield, & Powers, 2012). No systematic review has yet been published on panic self-efficacy as a mediator in CBT for PD. The present paper defines panic self-

efficacy as perceived ability to cope with or control panic attacks, anxiety-related bodily symptoms, negative thoughts about panic, or agoraphobic situations. We do not address general aspects of control or self-efficacy, for instance "locus of control" (Rotter, 1966), general self-efficacy (Schwarzer & Jerusalem, 1995), or self-efficacy in relation to other areas.

Aim

The study's primary aim was to conduct a systematic review of evidence for panic self-efficacy as a potential mediator of therapeutic outcome in CBT for PD, using both descriptive and quantitative (meta-analytic) procedures. We evaluated studies according to four criteria often required to establish mediation in an effective treatment (Baron & Kenny, 1986; Kraemer et al., 2002). The first three criteria were modeled after Baron and Kenny's test of mediation (1986) depicted in Fig. 1.

Criterion 1 examines whether the psychotherapeutic intervention (CBT) causes change in the proposed mediator (panic self-efficacy; the *a* path of Fig. 1). *Criterion 2* examines the association between change in the proposed mediator and therapeutic outcome (the *b* path). *Criterion 3* examines formal statistical mediation. According to Baron and Kenny (1986) this requires (a) a reduction of the association between treatment and outcome after controlling for the contribution of the proposed mediator (from *c* to *c'*), or (b) as suggested by Sobel (1982), an indirect mediational effect as indicated by the interaction of path *a* and path *b*. Theoretically, the indirect, mediated *a × b* pathway in Sobels's socalled "product of coefficients" approach should correspond to the *c* minus *c'* pathway in the Baron and Kenny "causal steps" approach (Preacher & Hayes, 2008). *Criterion 4* examines whether a study establishes a causal relation between change in the proposed mediator and change in outcome either by establishing a timeline (mediator precedes outcome) or by experimental manipulation of the proposed mediator (Kazdin, 2007; Kraemer et al., 2002). It should be noted that mediation is sometimes conditional on moderator variables (e.g. treatment conditions or patient variables) in which case one may speak of "moderated mediation" (Preacher, Rucker, & Hayes, 2007). A variable may thus function as a mediator in one treatment condition, but not in another (i.e. moderated mediation).

Methods

Literature searches

We searched electronic databases (PubMed and PsycINFO) through June 2013, with the following key words in combination with *panic disorder* or *agoraphobia*: *CBT, cognitive behavior therapy, cognitive behaviour therapy, cognitive behavioural therapy, behavioral therapy, behavioural therapy, behavior therapy, behaviour therapy, exposure, cognitive therapy*. Two searches were performed at different times (January and June 2013), one by the first author and one by a research assistant. We checked reference lists from all the included papers for additional relevant studies.
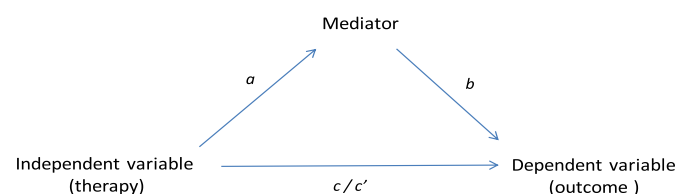

Fig. 1. Baron and Kenny's model of mediation.