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Creation and validation of the Cognitive and Behavioral Response to Stress Scale in a depression trial

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ABSTRACT

The Cognitive and Behavioral Response to Stress Scale (CB-RSS) is a self-report measure of the use and helpfulness of several cognitive and behavioral skills. Unlike other measures that focus on language specific to terms used in therapy, the CB-RSS was intended to tap the strategies in ways that might be understandable to those who had not undergone therapy. The measure was included in a clinical trial of cognitive-behavioral therapy for depression and completed by 325 participants at baseline and end of treatment (18 weeks). Psychometric properties of the scale were assessed through iterative exploratory and confirmatory factor analyses. These analyses identified two subscales, cognitive and behavioral skills, each with high reliability. Validity was addressed by investigating relationships with depression symptoms, positive affect, perceived stress, and coping self-efficacy. End of treatment scores predicted changes in all outcomes, with the largest relationships between baseline CB-RSS scales and coping self-efficacy. These findings suggest that the CB-RSS is a useful tool to measure cognitive and behavioral skills both at baseline (prior to treatment) as well as during the course of treatment.

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1. Introduction

Cognitive behavioral therapy (CBT) is an established, evidence-based treatment for depression (American Psychiatric Association, 2010; Hollon and Dimidjian, 2014). A major focus of CBT is educating patients about the role that thoughts and behaviors play in generating and maintaining depressive symptoms and teaching them cognitive and behavioral skills that, when applied in their lives, facilitate therapeutic gains. Indeed, acquisition of these skills is proposed to be a critical mechanism of change in CBT for depression (Barber and De Rubeis, 1989). As the use of these skills predominantly takes place outside of the therapy session, it is important to develop measures to assess if and how they are used. Measures of cognitive and behavioral skills could aid the investigation of mechanisms of change and serve as an outcome that is more proximal than depressive symptoms in outcome studies.

Measures of cognitive and behavioral skills overlap with several research areas. First, many self-report scales measure general coping skills. Examples include The Ways of Coping Checklist (Folkman and Lazarus, 1980) which presents a series of Yes/No questions that measure problem focused and emotion-focused

coping strategies and the COPE Inventory (Carver et al., 1989) and Coping Skills Questionnaire (CSQ; Rosenstiel and Keefe, 1983) which both assess a broader range of coping strategies based on the frequency that a person applies each strategy. Second, several measures have been developed that measure skills more specific to CBT. While the constructs and methods vary from measure to measure, studies using these measures have found that frequency and quality of patient CBT skill use relate to depressive symptoms. For example, using the patient version and the observer (therapist) version of the Skills of Cognitive Therapy Scale (SoCT-P and SoCT-O), Jarrett et al. (2011) found that patients receiving cognitive therapy who reported higher comprehension and use of cognitive and behavioral skills at mid and post-treatment had lower depressive symptoms post-treatment. The Cognitive-Behavioral Therapy Skills Questionnaire (CBT-SQ; Jacobs et al., 2011) assesses frequency of both behavioral and cognitive skill use, and has been shown to improve among patients receiving CBT-oriented therapy. Behavioral skill use frequency has been assessed by the Behavioral Activation and Depression Scale (BADs; Kanter et al., 2007), in which patients report how frequently they engaged in behaviors related to depression such as doing things to avoid feeling sad or engaging in distracting activities. The scale also measures vulnerabilities and problematic coping strategies. In a trial for atypical depression, BADs scores improved concurrently with decreases in depressive symptoms (Weinstock et al., 2011).

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Existing measures of cognitive and behavioral skills often use language that is specific to, and taught during, therapy. This may introduce artifacts in pre-post assessment such as response shift (Sprangers and Schwartz, 1999), in which changes in self-reported skills may reflect not only changes in the use of the skills, but also changes in the patient's understanding of the construct (e.g. the definition of terms like negative thought, positive activity) and in the scaling (e.g. the meaning of what frequent use of a skill means may be change through CBT, thereby complicating the interpretation of change in scores. A notable exception is the Competencies of Cognitive Therapy Scale (Strunk et al., 2014), which uses everyday language meant to be understood without exposure to cognitive therapy, and can be used as a pre-post measure of cognitive skills. When people enter treatment they may have some patterns of responding to stressful situations, and some of these patterns may be adaptive and even consistent with cognitive and behavioral principles. Even outside of the context of treatment, individuals with better coping skills demonstrate fewer increases in depressive symptoms in the face of stressful life events (Adler et al., 2013), and so one's responses when faced with stressors may be valuable to assess at the beginning of treatment.

Developing useful self-report measures is valuable because other approaches to evaluating the quality of skills learned during therapy can be time consuming. The Skills of Cognitive Therapy – Independent Observer version (SoCT-IO; Brown et al., 2015) is an observer-rated measure that rates the frequency and quality of skill use during the review of taped therapy sessions. Observer ratings can provide a unique and valuable perspective. The SoCT-IO has demonstrated the ability to predict response to cognitive therapy when used to evaluate mid- to late- sessions during a course of cognitive therapy. However, it may be time- and cost-prohibitive for many researchers and clinicians to train and employ independent observers to rate therapy sessions on this scale. Another strategy to assess use of skills has been through independent coding of homework assignments, such as thought records (e.g., Rees et al., 2005). Although this has the benefit of addressing situations relevant to individual patients, it is also resource intensive, requiring both time and training, and can only be used with people who have learned how to complete the specific homework assignment.

Self-report scales measuring coping, whether general or specific to CBT tend to evaluate the use of coping strategies and skills based on frequency. It has been argued that such frequency-based measures are weak, as the usefulness of coping is dependent upon a good fit between a stressor and the coping strategy (Vitaliano et al., 1990). Any given strategy may be helpful in one context, but not in others. While evaluating the fit between coping and stressor can be useful, it is also time intensive. One proposed way to get closer to “fit” has been to evaluate self-reported self-efficacy and usefulness of coping strategies (Chesney et al., 2006). Indeed, such measures have been shown to be strongly predictive of response to CBT (Stiles-Shields et al., 2015).

Self-report measures of cognitive and behavioral skills that are relevant prior to and during treatment can advance the field by improving the understanding of how acquisition of skills and skill use during treatment relates to benefits accrued from CBT. Because frequency of skills use may not reflect an appropriate or adaptive use of skills (e.g. a person may use a skill in contexts where it is not useful), perceived usefulness ratings may add a unique perspective on self-report of skills (Chesney et al., 2006). The aim of this study was to develop a brief self-report measure that identifies cognitive and behavioral skills used and their perceived helpfulness for patients in CBT treatment, and to evaluate that measure in the context of CBT.

2. Methods

2.1. Participants

The sample comes from a randomized controlled trial of 325 participants receiving either face-to-face CBT or telephone administered CBT. Trial details and main outcomes can be found in the primary outcome paper (Mohr et al., 2012). Briefly, CBT was administered in an identical manner, with the exception of medium (face-to-face vs. telephone) and included both behavioral activation and cognitive restructuring strategies. There were no differences between treatments at post-treatment on measures of depressive symptoms. As such, for the current analysis, participants from both conditions were combined. Participants were required to meet criteria for major depressive disorder and score 16 or higher on the Hamilton Depression Rating Scale (HAM-D, Hamilton, 1960). Participants were also required to be at least 18 years old, to speak and read English, and to be available for 18 sessions of face-to-face or telephone therapy. Individuals were excluded if they (a) met diagnostic criteria for dementia, a severe psychiatric disorder, or depression of organic etiology; (b) had hearing or visual impairment that would prevent study participation; (c) reported alcohol or substance use severe enough to disrupt treatment as judged by two study psychologists; (d) exhibited severe suicidality; (e) were receiving or planning to start individual psychotherapy; or (e) had started antidepressant medication in the previous 10 days.

The study sample had a mean age of 47.5 years and a standard deviation of 13.1 years. The sample was 78% female ($n=252$) and 14% Hispanic or Latino ($n=44$), with 2 participants declining to answer. Participants were 24.2% Black ($n=72$), 62.8% White ($n=187$), 10.1% reporting more than one race ($n=30$), and 3% other ($n=9$), with 27 participants not reporting race. Married or cohabitating participants made up 33% of the sample ($n=107$). For highest education level reached, 11% ($n=34$) reported high school, 25% ($n=81$) reported some college, 37% ($n=119$) reported being a college graduate, and 28% ($n=91$) reported an advanced degree. Participants on active antidepressants accounted for 34% of the group ($n=110$). The mean depression score as measured by the Patient Health Questionnaire-9 (PHQ-9, Kroenke et al., 2001) was 16.8 ($SD=4.7$), and the mean HAM-D score was 22.9 ($SD=4.6$). Of the 325 participants included in the study, 294 completed the Week 18 end-of-treatment assessments. In addition, 28 completed fewer than five sessions and 59 completed at least 5 but fewer than 18 sessions.

2.2. Materials

2.2.1. Cognitive and Behavioral Response to Stress Scale (CB-RSS)

The Cognitive and Behavioral Response to Stress Scale was developed to measure possible cognitive and behavioral responses to stressful or upsetting situations. Two clinical psychologists generated 17 items based on the skills taught in CBT (Beck, 1995) as delivered in previous clinical trials (Mohr et al., 2001, 2000, 2005), including cognitive restructuring and behavioral activation, as well as other commonly used skills such as seeking social support, relaxation, and problem solving. The items were constructed to be understandable to people who have not received CBT, as well as those who have, to support a study participant's consistent interpretation of the items both prior to treatment and after receiving CBT. These items were then reviewed for content validity and wording by two separate psychologists as well as four lay persons, who made minor modifications to the wording of the items for understandability and added two items targeting maladaptive strategies that would be expected to decrease during treatment. These modifications brought the total number of items to 19. The group of four psychologists and four lay persons all reviewed and commented on the items individually, and then met as a group to arrive at a final consensus. For each skill listed on this scale, individuals are asked to evaluate frequency and perceived usefulness. As an example, Item 1 read: *During the past month, in a stressful or upsetting situation: (a) How often did you take a moment to figure out what you were feeling? 0=Never, 1=Rarely, 2=Occasionally, 3=Sometimes, 4=Often, 5=Very often, 6=Always; (b) How helpful was this in making you feel better? 0=Not at all helpful, 1=Slightly helpful, 2=Somewhat helpful, 3=Moderately helpful, 4=Fairly helpful, 5=Very helpful, 6=Extremely helpful, N/A=Didn't do this last month.* Participants were instructed to mark N/A for (b) if they responded with Never for (a). The full list of items is displayed in Table 1.

2.2.2. Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 is a 9-item depression symptom measure that asks participants to rate their frequency of DSM symptoms over the past 2 weeks (Kroenke et al., 2001). In this study, Cronbach's alpha was 0.78 at baseline and 0.90 at end of treatment.

2.2.3. Hamilton Rating Scale for Depression (HAM-D)

The HAM-D is a 17-item semi-structured interview-based measure of depression symptom severity (Hamilton, 1960). Compared to the PHQ-9, the HAM-D has more questions related to anxiety and somatic complaints and focuses more on symptom severity. Bachelor's level clinical evaluators who had received training and supervision by a licensed PhD-level psychologist conducted all clinical interviews for this study. The mean interclass correlation of interviewer ratings was 0.96 (Mohr et al., 2012).

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