



Processes of change in psychological flexibility in an interdisciplinary group-based treatment for chronic pain based on Acceptance and Commitment Therapy

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ABSTRACT

There are now numerous studies of Acceptance and Commitment Therapy (ACT) for chronic pain. These studies provide growing support for the efficacy and effectiveness of ACT in this context as well as for the role of ACT-specific therapeutic processes, particularly those underlying *psychological flexibility*. The purpose of the present study was to continue to build on this work with a broader focus on these processes, including acceptance of pain, general psychological acceptance, mindfulness, and values-based action. Participants included 168 patients who completed an ACT-based treatment for chronic pain and a three-month follow-up. Following treatment and at follow-up, participants reported significantly reduced levels of depression, pain-related anxiety, physical and psychosocial disability, medical visits, and pain intensity in comparison to the start of treatment. They also showed significant increases in each of the processes of psychological flexibility. Most uncontrolled effect sizes were medium or large at the follow-up. In correlation analyses changes in the four processes measures generally were significantly related to changes in the measures of depression, anxiety, and disability. In regression analyses the combined processes were related to changes in outcomes above and beyond change in pain intensity. Although in some ways preliminary, these results specifically support the unique role of general psychological acceptance in relation to improvements achieved by treatment participants. The current study clarifies potential processes of change in treatment for chronic pain, particularly those aiming to enhance psychological flexibility.

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There is a growing body of literature to support Acceptance and Commitment Therapy (ACT) (Hayes, Strosahl, & Wilson, 1999) in the treatment of chronic pain, including treatment outcome studies in both adult (McCracken, Vowles, & Eccleston, 2005; Vowles & McCracken, 2008; Wicksell, Ahlqvist, Bring, Melin, & Olsson, 2008) and pediatric samples (Wicksell, Melin, Lekander, & Olsson, 2009). Treatment outcome studies conducted so far suggest that relatively brief ACT interventions of between three to eight weeks can produce significant benefits in the emotional, physical, and social functioning of people with chronic pain. As further support for applications of ACT to chronic pain, secondary analyses within these studies show that the processes of psychological flexibility targeted in ACT appear to account for an appreciable proportion of the benefits

observed. However, a broader focus on processes of change is important to continue to clarify the roles of the separate processes defined within this treatment approach.

Simply stated, the assumption behind the application of ACT to chronic pain is that it is not merely the severity of pain or other symptoms in isolation that influences patient functioning, but also psychological relationships between these symptoms and behavior. Accordingly, ACT is explicitly not aimed at reducing pain or distress, or at changing the frequency or content of thoughts. Instead, ACT seeks to improve functioning for people with chronic pain by modifying the impacts of pain and other symptoms through acceptance and mindfulness methods. It does this by increasing *psychological flexibility*, defined in part as the ability to act effectively in accordance with personal values and goals in the presence of potentially interfering thoughts and feelings (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). In the model underlying ACT psychological flexibility entails six interrelated therapeutic processes: acceptance, cognitive defusion, contact with the present moment, self-as-context, values, and committed action.

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Vowles and McCracken (2008) reported the effects of a three to four week intensive treatment for chronic pain based on ACT. Significant improvements in pain, depression, pain-related anxiety, disability, medical visits, work status and physical performance were found following treatment and at a 3-month follow-up. Two ACT processes were examined in this study: acceptance of pain as measured by the Chronic Pain Acceptance Questionnaire (CPAQ; McCracken, Vowles, & Eccleston, 2004) and values-based action as measured by the Chronic Pain Values Inventory (CPVI; McCracken & Yang, 2006). Changes in acceptance of pain were related to changes in pain, depression, pain-related anxiety, physical and psychosocial disability and physical performance in the pre- to post-treatment interval and changes in values-based action were significantly associated with change in pain, depression and physical and psychosocial disability in the pre-treatment to follow-up interval.

In a randomized controlled trial Wicksell and colleagues (Wicksell, Ahlqvist, et al., 2008) compared treatment as usual (TAU) to a 10-session ACT-based protocol for patients suffering from whiplash-associated disorder. At a seven-month follow-up, ACT demonstrated better results than TAU in terms of disability, life satisfaction, fear of movement, and depression. Mediation analysis showed significant indirect effects for psychological inflexibility, as measured by the Psychological Inflexibility in Pain Scale (PIPS; Wicksell, Renöfält, Olsson, Bond, & Melin, 2008), in relation to changes in disability and life satisfaction. The PIPS is regarded as a measure of avoidance and cognitive fusion.

The role of a wider range of the components of psychological flexibility in the well-being and daily functioning of people with chronic pain has been examined in studies using correlational methods, mostly done at one point in time, without experimental manipulation or application of a treatment. These studies have illustrated the significant role of processes of general psychological acceptance (McCracken & Velleman, 2010; McCracken & Zhao-O'Brien, 2010), acceptance of pain (e.g., Mason, Mathias, & Skevington, 2008; McCracken et al., 2004), mindfulness (McCracken & Velleman, 2010; McCracken, Gauntlett-Gilbert, & Vowles, 2007), value-based action (McCracken & Yang, 2006) and general flexibility itself (McCracken, Vowles, & Zhao-O'Brien, 2010). The study of these varied processes has not yet been done as comprehensively during the course of treatment.

In order to demonstrate that the wider process of psychological flexibility as currently conceptualized is useful in the treatment of chronic pain it is necessary eventually to demonstrate that each of its component processes plays a significant role in treatment outcome. So far process studies of ACT in chronic pain have been limited, mostly constrained by the availability of appropriate validated measures. One way to expand this work is to expand within the process of acceptance. Thus far only specific pain-related acceptance has been studied in this context. An existing measure of general psychological acceptance, the Acceptance and Action Questionnaire (AAQ) (Hayes et al., 2004) could be used to assess acceptance conceived more broadly. It measures acceptance of unwanted thoughts and feelings without a specific focus on pain. Another way to expand this work is to select additional processes not yet examined. Acceptance, cognitive defusion, contact with the present, and self-as-observer are also regarded as the "mindfulness" processes within ACT (McCracken & Thompson, 2009). Hence, in a situation where there are few specific measures for most of the ACT processes, a measure of mindfulness could be used to reflect these. The role of mindfulness in ACT-based treatments has been subject to less study, although recent studies show that increases in mindfulness correlate with treatment effects with ACT (Forman, Butryn, Hoffman, & Herbert, 2009; Kocovski, Fleming, & Rector, 2009).

The purpose of the present study was to investigate a range of treatment processes in ACT for chronic pain that is more comprehensive in comparison to those investigated in previous studies, a range that includes for the first time general psychological acceptance and mindfulness. The simultaneous examination of multiple specific processes is expected to improve targeting of methods to optimize outcomes and to generally aid in treatment development (Kazdin, 2007; Preacher & Hayes, 2008). The specific aims of the present study were twofold. First, we sought to perform a detailed examination of treatment outcomes following an ACT-based treatment in a sample of chronic pain patients not previously studied for this purpose. Second, we sought to conduct treatment process analysis including four treatment processes: acceptance of pain, general psychological acceptance, mindfulness, and values-based action. Consistent with the ACT model, it was expected that patients would report an increase in the four process variables over the course of therapy. It was also expected that these changes would predict outcome such that patients who improved more on these processes would experience larger improvements in emotional, social, and physical functioning. Finally, we predicted that outcome would be more closely related to changes in the components of psychological flexibility than to changes in pain intensity since the focus of treatment was not specifically on reducing pain, but rather on changing how one responds to pain.

Method

Participants

Participants were patients who attended treatment at a tertiary care pain rehabilitation unit in southwest England between September 2006 and June 2009. All participants reported persistent pain of 3 months duration or longer and significant levels of pain-related distress and disability, and agreed with the rehabilitative focus nature of treatment. Participants were excluded from treatment if they required further medical tests or procedures or had conditions sufficient to interfere with participation in a group-based treatment, such as significant cognitive impairment or overwhelming psychiatric conditions. Inclusion and exclusion were determined by assessments from a specialist physician and clinical psychologist prior to being offered treatment. These assessments are primarily pragmatic in nature, for purposes of determining the appropriateness of treatment, and not focused on deriving formal medical or psychiatric diagnoses.

This study included 168 individuals (112 women, 56 men) between the ages of 18 and 77 years ($M = 43.5$, $SD = 13.0$) who completed a three-or-four-week course of interdisciplinary treatment for chronic pain, as well as the three-month follow-up session. The sample of 168 excluded 57 individuals who completed treatment, but did not attend the follow-up. These 57 were excluded because all of the primary analyses involved an examination of outcomes at the follow-up assessment.

The larger proportion of participants was women, 66.7%, as is typically the case in specialty services for chronic pain. Mean age was 46.2 years, $SD = 10.1$. They completed a mean of 13.6 years of education, $SD = 3.6$. They were almost exclusively White European in background, 98.2%. They were mostly married or cohabitating, 58.5%, and the remainder were single, 28.3%, divorced or separated, 11.4%, or widowed 1.8%. They were mostly out of work, 72.3%, and the average time period out of work was 76.5 months, $SD = 69.3$. The largest single group of patients was not working due to pain, 47.6%, followed by retired early specifically due to pain, 21.1%, working part time because of pain, 6.6%, working full time, 6.0%, working part time, 4.2% or other, 14.5%. The median

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