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Acceptance and Commitment Therapy for Chronic Pain: Evidence of Mediation and Clinically Significant Change Following an Abbreviated Interdisciplinary Program of Rehabilitation

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Abstract: **There is an emerging body of evidence regarding interdisciplinary acceptance and commitment therapy in the rehabilitative treatment of chronic pain. This study evaluated the reliability and clinical significance of change following an open trial that was briefer than that examined in previous work. In addition, the possible mediating effect of psychological flexibility, which is theorized to underlie the acceptance and commitment therapy model, was examined. Participants included 117 completers of an interdisciplinary program of rehabilitation for chronic pain. Assessment took place at treatment onset and conclusion, and at a 3-month follow-up when 78 patients (66.7%) provided data. At the 3-month follow-up, 46.2% of patients achieved clinically significant change, and 58.9% achieved reliable change, in at least 1 key measure of functioning (depression, pain anxiety, and disability). Changes in measures of psychological flexibility significantly mediated changes in disability, depression, pain-related anxiety, number of medical visits, and the number of classes of prescribed analgesics. These results add to the growing body of evidence supporting interdisciplinary acceptance and commitment therapy for chronic pain, particularly with regard to the clinical significance of an abbreviated course of treatment. Further, improvements appear to be mediated by changes in the processes specified within the theoretical model.**

Perspective: ***Outcomes of an abbreviated interdisciplinary treatment for chronic pain based on a particular theoretical model are presented. Analyses indicated that improvements at follow-up mediated change in the theorized treatment process. Clinically significant change was indicated in just under half of participants. These data may be helpful to clinicians and researchers interested in intervention approaches and mechanisms of change.***

Key words: *Acceptance and commitment therapy, chronic pain, interdisciplinary, growth modeling, reliable change, clinical significance.*

Chronic pain is an important health problem frequently associated with substantial emotional distress, disruptions in physical and social functioning, and reductions in quality of life.[16,53] It is also associated with tremendous costs in terms of health care utilization and lost productivity. Recent estimates indicate costs to the United States alone range from $560 to $635 billion annually, exceeding the individual yearly costs of heart disease, cancer, and diabetes.[14]

Interdisciplinary cognitive and behavioral approaches are an established and effective treatment for chronic pain with good evidence of long-term improvements across a wide range of outcomes.[15] One specific application of these interdisciplinary programs, based on acceptance and commitment therapy (ACT),[19,20] has accumulated evidence of positive treatment outcomes across a range of settings and patient samples[54,64] through follow-ups of as long as 3 years.[53] Further, a number of these outcome studies indicate that a significant percentage of patients demonstrate change exceeding that which could be accounted for by

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measurement error alone in at least 1 key outcome domain.[33,62] Evidence of such "reliable change" is one of the 2 criteria for clinically significant change suggested by Jacobson and colleagues.[24,25] To date, no study of ACT has examined the second criterion of clinically significant change, which entails a comparison with normative data from a nonclinical or successfully treated sample.

A distinguishing feature of ACT is its specification of processes by which treatment is theorized to have its effect. The primary treatment process within ACT is termed *psychological flexibility*, which in the context of chronic pain includes a willingness to experience pain when pain control efforts are ineffective or interfere with important areas of functioning, nonjudgmental moment-to-moment attentiveness to ongoing experience, clarity in what is valued, and concordance between behavioral activity and these values.[21,40,64] Psychological flexibility has been the subject of significant cross-sectional and longitudinal study in chronic pain (see[51] for a review). Of specific relevance to treatment, correlation and regression-based approaches have indicated that changes in processes of psychological flexibility account for significant variance in treatment-related changes in functioning.[32,61-63]

In order to more fully assess the role of these processes as potential active treatment mechanisms, however, formal tests of mediation are necessary. To date, only a single study in an adult population has performed a formal test of mediation, using the products of the coefficients approach,[29] in a small trial for chronic pain associated with whiplash in adults[66] (see also[65] for an example in pediatric chronic pain). Further examination of mediation is therefore warranted. In particular, the use of multilevel modeling methods would provide novel results that examine individual, as well as group, patterns of change and allow for an examination of potential covariates, such as pain and demographic variables.

The overall purpose of the present study was to expand outcomes analysis of interdisciplinary ACT for chronic pain in several key areas. First, following the points raised in the preceding paragraph, we sought to perform an examination of individual patterns of change during treatment using a multilevel mediation model that allowed for testing of within-individual and between-individual change in the association between psychological flexibility and treatment outcomes over time.

Second, we sought to perform an evaluation of both the reliability and clinical significance of change in accordance with both the criteria of Jacobson et al.[20] Comparison data were drawn from the follow-up analysis of Vowles et al,[53] which indicated that completers of interdisciplinary ACT were, on average, maintaining the significant treatment gains achieved at a follow-up assessment occurring 3 years after treatment completion.

Third, and finally, there was a clinically relevant and pragmatic aim to these analyses. To date, the largest body of work concerning interdisciplinary ACT for adult chronic pain has come from open trials of a single treatment program (the Bath Centre for Pain Services), involving approximately 90 to 120 hours of intervention over the course of 3 to 4 weeks (eg,[32,36,62]). In 2009, an entirely new service was established that was funded to provide treatment that was approximately half as intensive as that of this previous work. These analyses, therefore, represent the first formal, open trial evaluation of this newly established and abbreviated program of interdisciplinary ACT.

Three hypotheses were made. First, treatment completers would exhibit significant improvements in measures of physical and emotional functioning, health care utilization, analgesic use, and physical movement at posttreatment and a 3-month follow-up appointment. Second, changes in measures of psychological flexibility would mediate changes in measures of outcome. Finally, there would be evidence of reliable and clinically significant change in a significant number of patients.

Methods

Participants

Participants included consecutive referrals beginning treatment from June 2010 through July 2012 within an interdisciplinary pain rehabilitation service located in the Midlands of England. Selection criteria included the experience of persistent pain for 3 months or longer and clinically significant levels of pain-related distress and disability. Further, patients had to be open to the pursuit of a rehabilitative course of treatment for chronic pain, as opposed to one that focused primarily or exclusively on pain reduction. Exclusionary criteria for treatment included the requirement of further medical tests or procedures, the inability to understand spoken English, and unwillingness or inability to participate in a group-based treatment program (eg, impaired neurologic functioning, pronounced or poorly controlled psychiatric conditions). This research was approved by the local ethics board of the National Health Service, and all study participants provided informed consent.

In total, 144 individuals began treatment. Of these, 18 individuals (12.5%) discontinued treatment as they felt it was too physically demanding or was not appropriate for their needs, and a further 9 (6.3%) dropped out secondary to issues unrelated to treatment (eg, occurrence of other illness, return to work). No individuals were discharged early by the treatment team. The remaining 117 individuals provided pre- and posttreatment data, and 78 (66% of treatment completers) additionally provided 3-month follow-up data.

With regard to treatment completers, the majority were women (71.8%), identified themselves as white European (99.1%). With regard to relationship status, 62.4% were married or cohabiting, 19.7% were single, 12.8% were divorced, and 5.1% were widowed. Average age was 45.5 years (standard deviation [SD] = 11.0), whereas average years of education averaged 13.8 (SD = 2.4). Only 29.1% were working on a full- or part-time basis, with the remainder unemployed. Median pain duration was 4.4 years (range, .25 to 45.6). The most frequently identified pain location was low back (38.5%). Other locations were full body: 25.6%; abdominal/genital: 12.8%; neck: 8.5%; upper limb: 6.0%;