

Mediators of change in Acceptance and Commitment Therapy for pediatric chronic pain

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ABSTRACT

Even though psychological interventions are well established in the treatment of pediatric chronic pain, there is a clear need for further development, especially with severely disabled patients. However, optimizing effectiveness in psychological treatments for pain requires clarification of the mechanisms of action. Studies addressing change processes are scarce, however, particularly in relation to pediatric chronic pain. Acceptance and Commitment Therapy (ACT), as an extension of traditional cognitive behavior therapy, is essentially aimed at improving functioning by increasing the ability to act effectively in the presence of pain and distress, that is, psychological flexibility. ACT has shown promising results for both adult and pediatric chronic pain. In the present study, the mediators of change in an ACT-oriented treatment for pediatric chronic pain were examined using a bootstrapped cross product of coefficients approach. Pain interference and depression were used as outcome variables. Six different variables relevant to theories underlying ACT and cognitive behavior therapy were included in the analyses as possible mediators of change: pain impairment beliefs, pain reactivity, self-efficacy, kinesophobia, catastrophizing, and pain intensity. Results illustrated that pain impairment beliefs and pain reactivity were the only variables that significantly mediated the differential effects of treatment on outcomes at follow-up. Also, these 2 mediators were shown to independently predict effects in outcome variables at follow-up while controlling for earlier effects in outcome, but only for the ACT condition. Although tentative, the pattern of results suggests that variables consistent with psychological flexibility mediate the effects of ACT-based interventions to improve functioning in patients with chronic debilitating pain.

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1. Introduction

Pediatric chronic pain is common [16,53], and can be associated with significant disabilities [25,29,51] that may continue into adulthood [5,78,80]. Psychological treatments, particularly cognitive behavior therapy (CBT), has proven useful for adults with chronic pain [15,24], but randomized controlled trials (RCT) with pediatric patients are still scarce [14,52]. Psychological treatment represents a wide variety of interventions with various objectives (eg, decreased pain and/or related distress, improved self-efficacy) [63]. Reductions in pain and distress have typically been the

primary outcome variables, rather than increases in functional abilities [14,51,79]. Also, evaluations of such interventions have largely addressed effectiveness rather than the identification of change processes [69]. Thus, the processes through which psychological treatments operate are still unclear [48], and the clarification of these change processes is considered a central target for current clinical research [15,31,32,52]. Although such studies have recently increased [36,57,65], process analyses of psychological treatments of pediatric pain are sparse.

Recent research has illustrated that greater acceptance of chronic pain is associated with less avoidance of important activities, better emotional well-being, and less health care utilization [41–43]. Furthermore, the empirical support for acceptance-oriented interventions, primarily Acceptance and Commitment Therapy (ACT) [22], has increased for both adult [44,46,82] and pediatric [83,85,86] chronic pain. ACT was recently listed by Divi-

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sion 12 of the American Psychological Association as an empirically supported treatment for “chronic or persistent pain in general” [10]. ACT explicitly aims at improving functioning and quality of life by teaching patients to experience negative thoughts, emotions, and bodily sensations in a more open and flexible way, in the service of engaging in values-oriented behaviors while in the presence of potentially interfering pain and distress. In ACT, this behavioral pattern is labeled “psychological flexibility” [21]. Studies have indicated that psychological flexibility may moderate and/or mediate changes in functioning [35,75,87]. However, no study has yet explored the mediating effects of variables related to psychological flexibility in ACT-oriented treatments for pediatric chronic pain.

We recently reported the results from an RCT with pediatric longstanding pain, illustrating that ACT was more effective than a multidisciplinary treatment including amitriptyline (MDT) [85]. Thus, ACT as a development within CBT appears promising for pediatric chronic pain. However, the therapeutic effects of ACT may be due to several different change processes. Therefore, this study presents a planned second set of analyses conducted to investigate these change processes, or mechanisms of action, by evaluating the mediating effects of variables related to psychological flexibility in comparison with other variables less associated with psychological flexibility yet commonly used within cognitive and behavioral theories.

2. Method

2.1. Setting and participants

The setting and participants were thoroughly described in the previously presented RCT [85], but a brief presentation will be provided here. Participants were recruited from consecutive patients with longstanding idiopathic pain referred to the Behavior Medicine Pain Treatment Service at Astrid Lindgren Children’s Hospital, Karolinska University Hospital. Patients aged between 10 and 18 years with pain duration of more than 3 months were considered eligible for inclusion in the study. Patients were excluded if: (1) pain was explained by an identified pathological process (eg, arthritis, cancer, inflammatory bowel disease); (2) coexisting psychiatric or psychosocial issues were considered more relevant than pain to functioning, including risk for suicide (assessed in the psychological screening interview); (3) they had a reduced proficiency in speaking Swedish; (4) they suffered from major cognitive dysfunctions resulting in difficulties following a conversation and/or understanding the description of the study; (5) they were currently participating in another rehabilitation program based on cognitive behavior therapy; and (6) they were previously treated with amitriptyline. A total of 32 participants were included in the study and randomized to 1 of the 2 treatment conditions, and 30 participants completed treatment. Given the exploratory nature of this study, only the participants who completed the treatment and assessments were included in the analyses.

The present sample consisted of 23 girls and 7 boys, with an average age of 14.7 years (range 10.8–18.1) and a mean time since pain onset of 33 months (range 6–96 months). Of these, 6 participants suffered primarily from headache, 7 were mainly bothered by back and/or neck pain, 6 reported widespread musculoskeletal pain, 6 presented with complex regional pain syndrome, 2 participants reported visceral pain, in 2 cases pain was primarily located in the lower extremities, and 1 of the participants presented with a postherpetic-type cheek pain. Furthermore, continuous, spontaneous pain was seen in 21 of the participants, and 9 reported recurrent pain. Allodynia or hyperalgesia was present in 15 participants.

As described in the RCT, participants reported a substantial amount of pain, distress, and difficulties with pain adjustment, as

indicated by elevated scores on assessments of, for example, disability, kinesiophobia, and depression.

2.2. Intervention

2.2.1. Acceptance and Commitment Therapy (ACT)

The ACT intervention was conducted individually and included approximately 10 weekly sessions with the participant and 1–2 sessions with the parents. In total, including parental and follow-up sessions, the ACT group received between 7 and 20 sessions (mean 13, SD 3.5).

The 2 psychologists involved in the intervention were trained in CBT, and both the psychologists and the physician had experience as well as training in ACT. Treatment fidelity was maintained through continuous discussions of treatment processes. We refer to previous papers for a more detailed presentation of the clinical model [82,83,86]. However, a short description of the clinical model is provided.

In ACT [22], avoidance of pain and distress is conceptualized as a core problem that substantially contributes to disability and reduced quality of life. According to the theory underlying ACT, avoidance occurs primarily when negative thoughts and emotions have excessive or inappropriate impact on behavior (denoted as cognitive fusion). The core intervention is considered to be acquisition of new behavioral responses during exposure to personally important situations and activities that have been previously avoided due to pain and distress. In contrast to treatments that emphasize reduction or control of symptoms, ACT promotes acceptance of negative reactions that cannot be directly changed (thoughts, emotions, bodily sensations) in favor of engaging in activities that are meaningful although possibly painful or fear provoking (ie, exposure). As part of this process, the patient is also trained to distance him/herself from pain and distress in order to decrease the impact of these experiences on behavior (cognitive defusion). The treatment objective is to improve functioning by increasing psychological flexibility, defined as the ability to act effectively in accordance with personal values while in the presence of previously interfering thoughts, emotions, and bodily sensations [21].

In parental interventions, the shift in perspective from symptom alleviation to valued life was emphasized, as well as the principles of exposure and operant mechanisms. The parents’ difficulties with engaging in effective coaching behaviors due to their own negative reactions were addressed using similar ACT processes as described above (ie, values orientation, acceptance, and cognitive defusion).

2.2.2. Multidisciplinary treatment and amitriptyline (MDT)

A psychiatrist, a child psychologist, a physiotherapist, and a pain physician, all experienced in working with longstanding pediatric pain, performed the MDT. Participants were seen by the different health care providers based on individual needs. A biobehavioral model of longstanding pain provided a general theoretical framework for this clinical approach, emphasizing perceived stress in everyday life as an important factor predicting the severity of longstanding pain and disability. This approach is supported in several articles and summarized in the biobehavioral model of pediatric pain [67,77]. Regarding amitriptyline, doses were increased by 10 mg every week up to 50 mg, and then by 25 mg up to a maximum of 100 mg, with median max doses = 50 mg (mean 64.3, SD 27.5). The increase of doses was stopped when severe side effects appeared (eg, sedation, dry mouth). In total, the MDT group received between 7 and 59 sessions (mean 22.8, SD 15.4). Amitriptyline was administered during a period of 1.2 months to 19.6 months (mean 10.3, SD 5.9) [85].

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