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Cognitive Behavioural Therapy and Acceptance and Commitment Therapy as management strategies for chronic pain

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Abstract

Background: Chronic pain is a debilitating condition that affects the individual in complex ways. However, it is a subjective experience that can be unresponsive to medical treatment, requiring psychological interventions to address its complex and multidimensional nature. CBT and ACT are recommended, yet there is a need to further our understanding on how these management strategies are effective. The present review aims to improve our understanding of the role of CBT and ACT in the management of chronic pain. *Method:* A literature search was conducted using PsycInfo, Medline, and CINAHL complete, followed by a narrative synthesis and critical appraisal. *Findings:* CBT and ACT have beneficial effects across several domains of chronic pain, but methodological issues limit our understanding of how this is achieved. *Discussion:* Future research should focus more on how CBT and ACT lead to positive changes for people with chronic pain. Specifically, there is a need for more detailed explanations of how the interventions are designed. Also, a wider consideration of individual preferences (treatment goals and preferred outcomes) as a desired outcome, and the impact of therapist and group effects.

Introduction

Chronic pain is an unpleasant sensory and emotional experience that lasts longer than three months, is unresponsive to medical treatment, and is unique to the individual (International Association for The Study of Pain [IASP], 1994). Approximately 19% of adults in Europe live with chronic pain (Breivik, Collett, Ventafridda, Cohen & Gallacher, 2006). It has been associated with negative thoughts, sleep disturbances,

and depression (Breivik et al., 2006; Fava, Fabri, Sirri & Wise, 2007). Moreover, it has a negative impact on quality of life and social functioning for the individual, making it harder to maintain a job, relationships, and leisure activities (Duenas, Ojeda, Salazar, Mico & Failde, 2016). Chronic pain can negatively impact both the mental and physical health of individuals. Drug treatments are often not sufficient as a stand-alone treatment for pain management, and are associated with unpleasant side effects or risks of addiction (Turk, Wilson & Cahana, 2011; Hutchinson et al., 2007). The multidimensionality of chronic pain requires a multi-disciplinary approach to manage it, including the use of psychological interventions.

Cognitive Behavioural Therapy (CBT) and Acceptance and Commitment Therapy (ACT) have been recommended for chronic pain (Roditi & Robinson, 2011). Both therapies are based on the theory that the difficulties we experience are maintained by our thoughts, feelings and behaviours influencing each other (Joseph, 2010). However, they differ in the way that they target their desired outcomes. For example, ACT focuses on core principles that work together to develop psychological flexibility (awareness, openness, and focus), targeting overall quality of life, rather than pain intensity (Gundy, Woidneck, Pratt, Christian & Twohig, 2011). In contrast, CBT aims to identify and challenge negative thoughts, leading to a change in maladaptive feelings and behaviours, with the goal of decreasing chronic pain and increasing daily functioning (Turner & Romano, 2001).

A recent meta-analysis demonstrated that CBT and ACT have significant positive outcomes and moderate effect sizes when it comes to managing chronic pain (Veehof, Trompetter, Bohlmeijer & Schreurs, 2016). However, information about how the interventions were delivered was missing, so we cannot be certain about what the mechanisms of change were. Also, a systematic review of randomised controlled trials (RCTs) found similar results for CBT in managing chronic pain (Williams, Eccleston & Morley 2012). Whilst the limitations of RCTs are acknowledged by the authors, the perspectives of people with chronic pain are not considered. As the impact of chronic pain is complex and variable, it is important to understand which outcomes the person values more. This is a challenge for both clinicians and researchers due to the tension

between identifying the potentially idiosyncratic needs of the individual, whilst also establishing the overall benefits to a population. Notwithstanding this, our understanding of the potential of CBT and ACT in the management of chronic pain is still limited, as it is not enough to simply establish statistically significant effects of intervention outcomes (Michie, Atkins & West, 2014).

With this background in mind, a literature search was conducted using PsycInfo, Medline, and CINAHL complete. Results were limited to studies that were published between the years 2005 – 2019, were peer-reviewed, and included participants over the age of 18 experiencing any form of chronic pain. The following search terms were used: (“Chronic Pain” OR “Persistent Pain” OR “Long Term Pain”), AND (“CBT” or “Cognitive Behavioural Therapy*” OR “ACT” OR “Acceptance and Commitment Therapy”), AND (“Intervention” OR “Treatment” OR “Therapy” OR “Program”). This narrative review aims to critically appraise the selected literature on CBT and ACT to understand the effectiveness of both as management strategies for chronic pain.

Quality of CBT and ACT interventions

Overall, CBT and ACT improve health and wellbeing for people with chronic pain (Ehde et al., 2014; Georgescu et al., 2018; Holmes et al., 2019; McCracken, et al., 2006; Vowles & McCracken, 2008), but it is not clear how this is achieved. For example, Trompetter, Bohlmeijer, Veehof and Schreurs (2015) studied the effectiveness of online ACT in improving chronic pain and stated that their procedure included the therapeutic process of experiential avoidance of pain and psycho-education, but they did not explain the specific steps involved in each process. Similarly, Baranoff, Hanrahan, Burke and Connor (2016) studied the effects of a low intensity ACT group therapy on improving chronic pain and stated that their procedure included specific pain and life management strategies, yet did not explain what these involved or why they were preferable to other ACT strategies. Moreover, Vowles and McCracken (2008) studied the impact of ACT on chronic pain and but did not explain the techniques that they used. For example, they used cognitive diffusion exercises, but did not elaborate on what these involved. For an intervention to be effective and for clients to fully benefit, a detailed understanding of the specific aspects that bring about the desired change is

needed (Michie, van Stralen and West, 2011). Without this, future studies seeking to replicate these findings could potentially use different strategies to those in the original studies, calling into question the fidelity to the therapeutic technique. Furthermore, this can potentially impact clinical effectiveness, as if it is not clear what aspects of ACT bring about therapeutic change, clinicians cannot confidently adhere to them.

Overall, ACT is an effective management strategy for chronic pain. However, further details about the intervention that was delivered would be welcome, because the absence of such details and not knowing how the results were achieved limits our understanding of ACT as an intervention for chronic pain.

In contrast to the aforementioned literature, Cederberg et al. (2016) examined acceptance, anxiety, and depression as mediators of ACT, and found that it was specifically the acceptance component of ACT that led to positive outcomes for people with chronic pain. Also, their findings are supported by previous literature demonstrating a relationship between improvements in domains of chronic pain (e.g. quality of life, pain catastrophizing, and pain severity) and acceptance (Mason, Mathias & Skevington, 2008; Viane, et al., 2003). Similarly, Vowels and McCracken (2008) analysed the variance in their study and found that acceptance partially explained the positive outcomes (pain acceptance, pain anxiety, and pain interference), arguing that an early focus on acceptance would lead to longer lasting positive effects. However, neither Cederberg et al. (2016) or Vowels and McCracken (2008) explicitly outlined the ACT treatment protocol that they followed. Consequently, further investigations are needed to clarify how acceptance can be nurtured through ACT, as it is unclear if only certain methods garner the necessary levels of acceptance required to effectively manage chronic pain.

By comparison, Holmes et al. (2019) further our understanding of what makes ACT an effective treatment by providing a detailed outline of their treatment protocol. Specifically, they investigated the effectiveness of group ACT therapy in treating chronic pain from Chiari Malformation (a condition where the lower part of the brain pushes onto the spinal canal). Holmes et al. (2019) found that six treatment protocols (delivered across 12 group sessions) were key in effective treatment: awareness of the present

moment, diffusion, values, committed action, acceptance, and self-as a context. Furthermore, they provided a table outlining session goals, session content, and provided an explanation of the specific exercises that were used.

Therefore, it can be argued that there is a working understanding of how ACT achieves positive outcomes; however, it is not clear if this is due to acceptance alone. ACT aims to use the core components (acceptance, present moment awareness, cognitive diffusion, self as context, values, committed action) to foster psychological flexibility (Hayes, Strosahl & Wilson, 2012). Of the studies that were reviewed, only Holmes et al. (2019) examined the role of all the core components of ACT and clearly outlined their treatment protocol. Further research examining the extent to which the findings are reliable, as well as the role of the other core components of ACT, would develop our understanding of ACT as a treatment for chronic pain.

Similarly, research on CBT as an intervention for chronic pain does not always offer sufficient detail about intervention design, limiting our understanding of how positive outcomes for people with chronic pain are achieved. Knoerl, Ellen, Smith and Weisberg (2015) conducted a systematic review and found that the steps involved in CBT varied widely across studies, but it is not clear if such variability is preferable to a more standardised approach to CBT. In the present review, it was found that interventions were based on different manuals, but it was not always clear from published studies which aspects of the manuals were used or omitted. For example, Stratton, Bender, Cameron and Pickett (2015) found that group CBT significantly improved pain catastrophizing, pain related disability, and quality of life in US army veterans. However, they used a CBT programme that was specifically designed for treating chronic pain in army veterans. While Stratton et al. (2015) provided the sources that were used to design their CBT intervention, it is not clear how closely these were followed, or if any aspect of the protocol was modified to suit the specific population of the study. Similarly, Linden, Scherbe and Cicholas (2014) found that low-back pain specific CBT significantly improved pain intensity, fear of pain, and pain-related avoidance behaviour. In contrast to Stratton et al. (2015), Linden et al. (2014) were able to outline each session of their intervention and what it entailed (e.g. session one asked

patients to report on current coping strategies). Yet Linden et al. (2014) designed their intervention based on specific manuals and pain management programmes, but did not outline how closely these were followed, or what made their CBT different to non-back pain specific CBT. Similarly, Yoshino et al. (2015) provided an outline of the number of sessions they used in their intervention, and what each session consisted of (e.g. sessions 2 and 3 involved the introduction of pain diaries). However, there are still limitations in understanding how the outcome was achieved, as certain sections of their treatment protocol lack a clear explanation. For example, Yoshino et al. (2015) tailored their treatment protocol specifically to chronic pain caused by somatoform disorder; however, it was not clear how their protocol differed from the original. This limits our understanding of what makes CBT effective in the management of chronic pain, as the way in which the researchers modified their treatment protocol can mean that it was mostly effective for chronic pain caused by that particular condition. Similarly, Georgescu et al. (2018) found that a CBT specific treatment (cognitive restructuring) and an ACT specific treatment (acceptance) were both equally effective in treating chronic pain. This particular study provided a clear outline of their treatment protocol, such as explaining exercises participants were taught to facilitate either cognitive restructuring or acceptance. Providing specific details about intervention protocols and therapeutic components helps to further our understanding of the effectiveness of CBT and ACT and also allows for the potential to replicate findings.

It can be argued that the complex nature of chronic pain demands diversity in the psychological therapies that are used to promote effective management. Typically, multidisciplinary teams help people to manage chronic pain through psychological therapies and various other methods, including physiotherapy and medication (Scascighini, Toma, Dober-Spielmann & Sprott, 2008). Clinically, there is a need to consider the type of chronic pain, the existence of co-morbidity, and the particular needs of individual patients. Indeed, the use of psychological therapy will depend on the type of chronic pain, individual needs, therapist specialization and biopsychosocial influences on the experience of pain (Roditi & Robinson, 2011). Similarly, individual differences in mood, coping styles and co-morbidity affect the experience of chronic pain; people with an underlying health condition and a more emotional coping style tend to report greater

pain intensity (Affleck, Tennen, Urrows & Higgins, 1991; Newth & DeLongis, 2007). Therefore, applying highly standardised forms of CBT or ACT may be counterproductive, as it would not address the unique nature of chronic pain for each individual. Yet, without a more explicit outline of treatment protocols used in research, it is unclear which aspects of CBT and ACT are necessary and which are optional for effective treatment of chronic pain. Hoffman et al. (2014) offer the template for intervention description and replication checklist (TIDieR) as a tool to provide such an outline. TIDieR provides a checklist that encourages researchers to log details of their protocol across 12 items: brief name, why, what (materials and procedure), who provided, how, where, when and how much, tailoring, modifications, and how well (planned and actual). Thus, researchers have a systematic way to outline their chosen treatment protocols for CBT and ACT to enable a more detailed understanding of their effectiveness for chronic pain. Future studies should adopt this approach to intervention reporting.

Further consideration should also be given to therapist and group effects, as both have been shown to impact clinical outcomes (Huppert, Kivity, Barlow, Gorman, Shear & Woods, 2014). Studies within this review found that a group format actually enhanced positive treatment outcomes, through the way that group members interacted with each other (Holmes et al., 2019; Stratton et al., 2015). Furthermore, Glombiewski et al. (2018) argued that greater clinician experience contributed to the large effect size in their outcomes. However, the other studies that were examined did not always clarify the extent to which therapist or group effects may have impacted their results. Consideration of these factors will be important in future research.

In summary, CBT and ACT are effective management strategies for chronic pain. However, the absence of detail in the respective treatment protocols limits our understanding of how CBT and ACT this is achieved. Equally limiting is the partial consideration of therapist and group effects. Thus, further research and detail on the active ingredients that bring about positive change for people living with pain are needed. Similarly, the disparity in the manuals which the interventions are based on, and the lack of clarity about the extent to which they are followed, further limit our

understanding. To build on existing research, future studies comparing different CBT and ACT manuals would be welcome, and a more detailed investigation of group and therapist effects. Additionally, providing more detailed accounts of fidelity to protocol, possibly through the TIDieR.

Individual preferences

Although multidimensional measures of chronic pain are used, it is not clear which outcomes individuals with chronic pain would consider meaningful, particularly with respect to how effective a particular intervention is. The studies discussed within this review show that CBT and ACT significantly improve chronic pain outcomes across multiple domains (e.g. pain-related disability and pain intensity.). However, the particular nature or type of chronic pain can vary between people. Equally, both CBT and ACT involve goal setting as a pre-requisite; indeed, Ramnero & Jansson (2016) argue that this factor not only improves effectiveness, but allows individuals to experience more meaningful treatment. Based on this, a consideration of individual goals and preferences during CBT and ACT would further our understanding of how chronic pain can be effectively managed. In a clinical setting, clients are typically interviewed about the extent of their pain, how they perceive it, what they do to manage it, and which outcomes are important to them (Dansie & Turk, 2013; Williams, 2013). However, these outcomes are not frequently included as research outcomes. For example, when comparing the effectiveness of CBT and Exposure (graded exposure to behaviours that trigger chronic pain), Glombiewski et al. (2018) did not focus on individual goals or identify which outcome was most important to patients with chronic pain. Similarly, Miro et al. (2018) assessed the impact of CBT on multiple aspects of chronic pain (e.g. pain catastrophizing, pain intensity, pain interference, and pain acceptance); however, individual preferences and goals were not assessed.

Most of the studies reviewed here capture the multidimensional nature of chronic pain, due to researchers using a variety of quantitative measures to assess the individual domains of chronic pain. For example, McCracken and Gutierrez-Martinez (2010) considered which outcomes the participants valued more, as they included the

Chronic Pain Values Inventory (McCracken & Yang, 2006). Allowing participants to rate the value that they placed on their family, intimate relations, friends, work, health, and growth or learning, and the degree to which they live according to their values (valued action). Furthermore, McCracken and Gutierrez–Martinez (2010) found that ACT managed chronic pain (in the form of greater pain acceptance and lower pain anxiety), by encouraging participants to engage in valued action. So, it can be argued that there is a working understanding of the meaningful effects for participants, but further research is needed to establish a clearer picture of the mechanisms of action.

In light of this, researchers could consider using patient generated outcome measures during treatment, which allow for personal definitions of domains affected by chronic pain (Kyte et al., 2015). For example, the Patient Specific Functional Scale (PSFS) (Stratford et al., 1995) asks patients to list at least three activities that they have difficulty doing due to their chronic pain, and rate how much their chronic pain interferes in their lives on a scale. Maughan and Lewis (2010) found that the PSFS was more responsive to clinically meaningful changes than instruments not focusing on patient generated outcomes. Similarly, when demonstrating the effectiveness of CBT in treating chronic pain, Heapy et al. (2018) found that CBT yielded greater improvements when participants were working towards a specific goal that they selected at the beginning of treatment. Heapy et al. (2018) further found that individuals with chronic pain consider improvements in physical functioning as more meaningful than reductions in pain intensity. Thus, considering individual goals would potentially improve the effectiveness of CBT and ACT in managing chronic pain. For example, research has found that CBT was more effective and resulted in longer lasting positive effects when preferred outcomes and perceived ability to achieve goals were considered (Oliver, Fisher, & Childs, 2016; van Kouilil et al., 2010). Similarly, Samwell et al. (2009) found that matching participants to treatment based on their own desired outcomes and perceptions of treatment led to greater overall improvements in pain-related disability. Therefore, there is a need for a better understanding of the important role of individual preferences in the management of chronic pain.

In summary, CBT and ACT have been shown to help in the effective management of chronic pain. It has been highlighted that a consideration of individual preferences impacts how effective CBT and ACT can be. Given this, future research ought to continue expanding our understanding of CBT and ACT as management strategies, through the key direction of individual preferences.

Conclusion

Overall, CBT and ACT can be used to effectively manage chronic pain, however the extent of our understanding of this effectiveness is limited. Namely, it is difficult to determine the mechanism of action due to a lack of detail about the intervention design and limited attention to mechanisms of change. Also, only a partial consideration of individual preferences, therapist and group effects further limit our understanding. Future studies should consider ways, such as TIDieR, to provide clearer and detailed steps used in the delivery of CBT and ACT across different contexts, enabling further elucidation of the precise mechanisms of change. Additionally, future studies into the effectiveness of CBT and ACT should consider placing more emphasis on the outcomes that participants value, and the impact of therapist and group effects, to better determine the extent of the effectiveness of different management strategies.

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