



Efficacy of Cognitive Behavioral Therapy in Managing Chronic Pain of Degenerative Conditions: An Overview of Randomized Clinical Trials and Meta-Analysis Studies

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Abstract

To cite this article:

Nchawanangwa K, Mwanza J, Kapenda C, Chiluba B.C, Efficacy of Cognitive Behavioral Therapy in Managing Chronic Pain of degenerative conditions: An Overview of Randomized Clinical Trials and Meta-Analysis Studies. *J of Prev and Rehab Med*, Vol. 2, No. 1, 2020, pp. 27-31. doi: 10.21617/jprm2020.215

Background: Cognitive behavioral therapy is a goal-oriented psychotherapy treatment that takes a hands-on, practical approach to problem-solving. It has been documented in various studies to have an impact when used in the management of chronic pain. It has been shown to lack the drawbacks of pharmacological and surgical treatments such as addiction and toxicity; and cost and recovery time, respectively. Cognitive behavioral therapy has also been shown to target cognitive distortions such as pain catastrophizing among other things. The objective of the review is to evaluate the effectiveness of cognitive behavioral therapy in the management of chronic pain of degenerative conditions.

Methods: This review article was conducted basing on the previous studies published from 2009-2019 and data analyzed was retrieved from Google Scholar, Elsevier and Science Direct. Only the articles that looked at effectiveness of cognitive behavioral therapy in the management of chronic pain from a physiotherapists point were included.

Results: The outcomes of the studies used varied and included reduction in pain intensity, pain disability, fear avoidance, catastrophizing and kinesophobia. The CBT approaches used across the studies also varied and included operant conditioning, biofeedback, relaxation techniques, pacing, cognitive coping techniques, graded activity and graded exposure.

Conclusion: Published randomized controlled trials provide good evidence for the effectiveness of cognitive behavioral therapy and how specific approaches may vary in effectiveness depending on the desired outcomes.

Keywords: *cognitive behavioral therapy, chronic pain, physiotherapy*

Introduction

Chronic pain is a significant and costly problem in the many populations throughout the industrialized world. Unfortunately, there have been concerns about the effectiveness of traditional medical interventions, suggesting the need for alternative chronic pain treatment strategies. However, the introduction of the biopsychosocial model of pain during the past decade stimulated the development of more therapeutically effective and cost-effective interdisciplinary chronic pain management programs [1].

Cognitive Behavioral Therapy (CBT) is the currently prevailing psychological management for individuals with chronic pain. Examples of the chronic pain conditions that can be managed with the aid of CBT include low back pain, headaches, arthritis, orofacial pain and fibromyalgia. CBT has also been applied to pain associated with cancer and its treatment. The CBT goals for pain management are to reduce pain and psychological distress, to improve physical function by helping individuals decrease maladaptive behaviors, increase adaptive behaviors, identify and correct maladaptive thoughts, beliefs and behaviors and increase self-efficacy for pain management [2].

The reduction of fear avoidance beliefs may mediate benefits of physiotherapy. The objective of cognitive behavioral therapy techniques is to modify negative pain behavior and disrupt the fear avoidance cycle, by changing the patient's social and environmental contingencies. It aims to decrease negative pain behavior and increase activity levels to enable patients to perform their desired activity despite pain. In chronic pain, a CBT approach aims to reduce disability [1].

Behavioral and cognitive treatments for chronic pain have become established in through the years since their exposition. There are many published open trials of treatment but few use control groups in which patients are randomized to treatments. Reviews, however, conclude that there is strong, if not overwhelming evidence for the efficacy of CBT in restoring function and mood and in reducing pain and disability-related behavior. Some reviewers regretted that CBT is not provided as part of the multidimensional chronic pain treatment. Despite the large number of CBT clinical trials, very few reports of the treatment effects have been published.

Materials and Methods

Only randomized controlled clinical trials (RCT) or systematic reviews and meta-analysis studies on the use and efficacy cognitive behavioral therapy in chronic pain were included. The articles included had to be published in English from the years 2009 to 2019. Data was retrieved from the electronic databases, Google Scholar, Elsevier and Science Direct, using search terms of cognitive behavioral therapy in chronic pain. See the eligibility and study chart flow in figure 1.

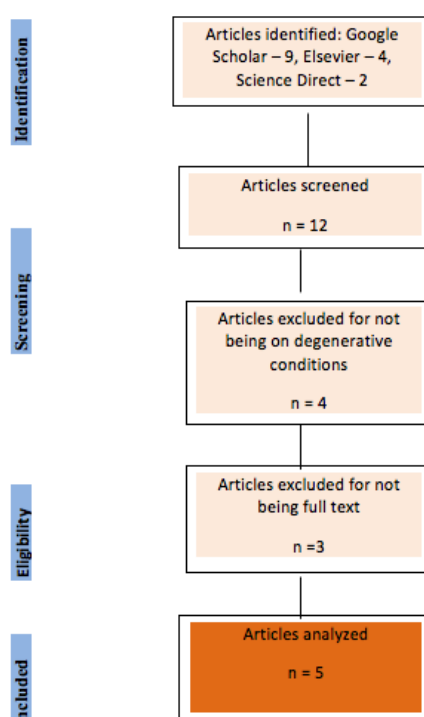


Figure 1: study eligibility and flow chart

Results

The reviewed studies showed a follow-up period ranging from three months to two years and were physiotherapy administered. These reviews have examined the effect of a range on treatments on chronic pain, including relaxation techniques, mindfulness-based techniques, acceptance-based techniques, biofeedback, psycho-education, and behavioral and cognitive-behavioral treatments.

Of the reviewed trials heterogeneity was present amongst included trials. Participants of varying pain duration were included. Intervention

components, namely dosage, duration and setting varied widely and a variety of different disability and/or functional measured were employed.

The results of the review showed moderate evidence that CBT is more effective than an ordinary management in reducing long term disability in a population with chronic pain. Moderate evidence was found that CBT may be more effective than traditionally-based physiotherapy in reducing post-treatment fear avoidance beliefs in chronic population but less effective than other behavioral interventions in reducing short term fear avoidance beliefs in a population. Moderate evidence suggests CBT is more effective than a placebo intervention in reducing short term pain in chronic pain. Findings that CBT may be more effective than usual care in reducing short term pain in chronic pain are not of clinical significance. The reviewed studies are illustrated in the forestry tree diagram in figure 2.

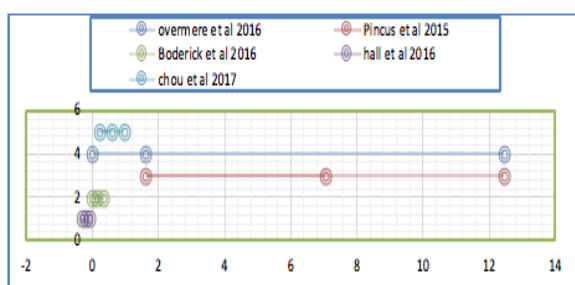


Figure 2: A forest tree diagram of CBT studies

Figure 2: A forest tree diagram of CBT studies
Chou et al showed a study of cognitive behavioral therapy that included 5 randomized control trials that had the following results : SMD, -0.60 [CI, -0.97 to -0.22]) resulted in lower post treatment pain intensity [3]

Pincus et al was a two arm study with a 95% CI in which contextual cognitive behavioral therapy had a showed 14.9 (12.38, 17.46) at 3 months and 13.8 (10.39, 17.17) at 6 months. The physiotherapy group on the other hand, showed results of 15.0 (12.64, 17.42) at 3 months and 13.7 (10.31, 17.09) at 6 months. These scores were obtained using the brief pain intervention tool [4] Overmere *et al* consisted of a group that was managed through neck specific exercises with a behavioral approach. Said group showed a mean of 16.1 with a standard error of 2.11 in the pain disability index while it showed a mean of 14.3 with a standard error of 1.47 on the pain catastrophizing scale [5]

A study by Hall *et al*, showed that compared to education and/or exercise interventions, it was found high-quality evidence that CBT had a greater effect (SMD; 95% CI) on reducing disability (-0.19 ; -0.32 , -0.07), pain (-0.21 ; -0.33 , -0.09); and moderate-quality evidence of little difference in quality of life (-0.06 ; -0.18 to 0.07). Sufficient information was provided on dose, setting, and provider; but not content and procedural information. Though the type of CBT component used (e.g., challenging unhelpful thoughts) was reported there was little detail on how it was operationalised. Moreover, access to treatment manuals, patient materials and provider training was lacking [6]

Broderick et al, showed baseline ratings of treatment expectation significantly moderated by 5 outcome variables: pain intensity composite (P 5 0.03), catastrophizing (P 5 0.04), self-efficacy (P 5 0.05), fatigue (P 5 0.03), and daily IVR pain ratings (P 5 0.03). Patients with lower expectations for the helpfulness of treatment had no improvement in pain, catastrophizing, and fatigue, though they did show an improvement in self-efficacy (d 5 0.37). The highest expectations were associated with the greatest improvement on these outcomes, especially for IVR pain (d 5 0.59), self-efficacy (d 5 0.83), and fatigue (d 5 0.60). Those with “average” (still strong) expectations experienced more moderate improvements IVR pain (d 5 0.37), self-efficacy (d 5 0.60), and fatigue (d 5 0.36) [7]

Discussion

The outcomes of the studies used varied and included reduction in pain intensity, pain disability, fear avoidance, catastrophizing and kinesophobia. The CBT approaches used across the studies also varied and included operant conditioning, biofeedback, relaxation techniques, pacing, cognitive coping techniques, graded activity and graded exposure.

Broderick et al examined moderators of treatment response in large RCT of OA patients with chronic pain who received either PCST a form of CBT, or usual care. Overall, RCT treatment effects were found to be significant for several of the primary and secondary outcomes, however, they tended to be small for CBT for pain. They however did showed the outcomes for demographic variables as encouraging in that for both men and women, patients of different race and ethnicity, as well as Body Mass Index, all

benefited equivalently from the treatment. This speaks to the generalizability of treatment efficacy across a range of patient groups. However it showed that age and education did moderate outcomes on three variables. The oldest patients showed the most robust treatment effect for pain and daily quality of day, whereas the younger patients did not. Their most highly educated patients showed improvement on catastrophizing, whereas high school and college educated patients did not; though our PCST treatment protocol did not specifically target catastrophizing [7]

The results of Overmere *et al*, which was a randomized controlled trial with a 2-year follow-up showed that physiotherapist-led Neck Specific Exercise with Behavioral approach (NSEB) had a better outcome on general disability and most of the psychological factors compared to the mere Prescription of Physical Activity. NSEB improved in Pain Disability Index and catastrophizing. More specifically, neck-specific training with the addition of a behavioral component significantly decreased general pain disability by 28% in the first 3 months and sustained this over 2 years. The active physiotherapy-led treatment, with the behavioral component, also decreased pain catastrophizing [5].

Pincus *et al*, demonstrated that Contextual Cognitive Behavioral Therapy (CCBT) was indeed credible and acceptable to patients with Low Back Pain. Pincus' findings from both patients and therapists suggested that patients randomized to CCBT should also receive a minimal amount of physiotherapy in conjunction with CCBT. Pincus goes on to suggest that a full trial that provided a combination of physiotherapy and CCBT against physiotherapy alone would probably achieve more equal ratings of credibility. Though the small number of Pincus study did not enable inferential testing, they did show that the changes in both acceptance and disability were greater in the group receiving CCBT than the control physiotherapy, suggesting that the intervention of CCBT + Physiotherapy is promising [4].

Chou concluded in his study that the therapies used produced small to moderate effects. However, according to Chou *et al*, more research is needed to identify and understand the incremental benefits of combining interventions, as well as which treatment combinations and sequences are most effective [3].

Conclusion

In all the analyzed studies, CBT was found to have no adverse effects and was not found to be inferior to any of the comparison interventions in reducing disability for pain as well as the other components of pain. The studies reported low risk of bias as well and found the treatments to effectively combat fear avoidance, improve mood and help participants move on with life despite their pain. No particular study in this review showed the strong support of one approach over another. The results of this review provide moderate evidence that in the chronic pain population. CBT was shown to be more effective than other interventions in producing sustained, clinically relevant improvements in long term disability. CBT is theorized to work through the modification of negative pain behaviors, specifically, by reducing fear avoidance. It could therefore be hypothesized that a reduction in fear avoidance beliefs would be accompanied by an improvement in disability, mood and physical activities. In this review, small to moderate evidence was found to suggest that CBT is more effective than other interventions in reducing immediate fear avoidance beliefs in a chronic population. It was also found to have long term effects that went on for as long as two years. Though the heterogeneity of the study outcomes made it difficult to stick to one element of pain, it did show the wide application in pain management.

Published randomized controlled trials provided good evidence for the effectiveness of cognitive behavioral therapy across the pain dimensions. However more research is needed to solidify this effectiveness. Further studies also need to show detailed methodology reports that show which CBT approaches were used and may be replicated at other sites.

Recommendations

CBT approaches were seen to have covered pain dimensions that general treatment does not cover. It was also showed to have long term effects. It is therefore essential that it be added to Physiotherapy practice as Physiotherapists see a lot of patients with chronic pain and see them over a long period of time with plenty relapses.

Evidence shows that with additional training, physiotherapists can deliver CBT interventions that are effective for patients with chronic pain. Physiotherapists who are

considering enhancing their treatment for patients with chronic pain should consider undertaking some additional training in how to incorporate CBT techniques into their practice to optimize treatment benefits and help patients receive long-lasting treatment effects.

Importantly, the results indicate that using a CBT approach, including a variety of CB techniques that could be easily adopted in a physical therapy setting, provides greater benefits for patient outcomes compared to brief education, exercise or physical techniques (such as manual therapy) alone. This provides further support that a combined treatment approach is likely better than one based on physical techniques alone.

Limitations

The author experienced limitations in the study that came in form of lack of accessibility for certain articles that had a promising abstract. The risk of bias is that the authors of the study runs a risk of bias as they are conducting a randomized trial in which cognitive behavioral therapy is being administered along with physiotherapy to an intervention group using a cross over design.

Declarations

Ethical approval

Not required

Conflict of Interest

The author declares that they have no conflict of interest.

Informed consent

All authors approved the final version of the manuscript.

References

- Gatchel R. J, McGeary, D. D, McGeary, C. A., & Lippe B. Interdisciplinary chronic pain management: Past, present, and future. *American Psychologist* 2014; 69(2), 119-130, <http://dx.doi.org/10.1037/a0035514>
- Turner J. A, Romano J. M. Cognitive-behavioral therapy for chronic pain. In J. D. Loeser & J. J. Bonica (Eds.), *Bonica's management of pain* Philadelphia, PA: Lippincott Williams & Wilkins 2001; 3rd ed., 1751-1758.
- Chou R, Deyo R, Friedly J, Skelly A, Hashimoto R, Weimer M, Fu R, Dana T, Kraegel P, Griffin J, Grusing S, Brodt D.E. Nonpharmacologic Therapies for Low Back Pain: A Systematic Review for an American College of Physicians Clinical Practice Guideline 2017
- Pincus T, Anwar S, McCracken M.L, McGregor A, Graham L, Collinson M, McBeth J, Watson P, Morley S, Henderson J, Farrin J.A. Delivering an Optimised Behavioural Intervention (OBI) to people with low back pain with high psychological risk; results and lessons learnt from a feasibility randomized controlled trial of Contextual Cognitive Behavioural Therapy (CCBT) vs. Physiotherapy 2015
- Overmeer T, Peterson G, Ludvigsson L.M, Peolsson A. The effect of neck-specific exercise with or without a behavioral approach on psychological factors in chronic whiplash-associated disorders A randomized controlled trial with a 2-year follow-up 2016
- Hall A, Richmond H, Copey B, Hensen Z, Williamson E, Jones G, Beth F. Physiotherapist-delivered cognitive-behavioral interventions are effective for low back pain but can they be replicated in clinical practice? A systematic review 2016
- Broderick J.E, Keefe J.F, Schneider S, Junghaenel U.D, Bruckenthal P, Schwartz E.J, Kaell A.T, Caldwell S.D, McKee M, Gould E. Cognitive behavioral therapy for chronic pain is effective, but for whom? 2016