



AOTA Evidence Briefs

Chronic Pain

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

CPAIN #3

Operant conditioning and cognitive-behavioral therapy (CBT) are equally effective in reducing physical and psychosocial disability in adults with chronic low-back pain.

Turner, J. A., & Clancy, S. (1988). Comparison of operant behavioral and cognitive-behavioral group treatment for chronic low back pain. *Journal of Consulting and Clinical Psychology, 56*, 261–266.

Level: IA1a

Randomized controlled trial, 20 or more participants per condition, high internal validity, high external validity.

Why research this topic?

At the time of this study, there had been little research examining the effectiveness of operant conditioning or CBT in the treatment of chronic low-back pain, and only one study compared the two approaches. Operant conditioning seeks to decrease pain behaviors and increase well behaviors by changing the social and environmental consequences associated with those behaviors. CBT seeks to modify a person's subjective experience of pain and his or her thoughts while he or she is in pain. It emphasizes the development of cognitive and behavioral skills for coping with pain.

What did the researchers do?

Turner and Clancy (1988), both affiliated with the University of Washington (Seattle), designed a study to compare the effectiveness of operant conditioning and CBT in the treatment of chronic low-back pain. The participants were patients with chronic low-back pain who had been referred to the researchers by physicians or had volunteered in response to publicity about the study. To be eligible, they had to be ages 20–65 years, have experienced persistent low-back pain for at least 6 months, and currently be married or living with a significant other. Of 95 who met the criteria for eligibility, 81 agreed to participate. Fifty-one were men, 30 were women. Their average age was 46 years, and the average duration of their current episode of pain was 6.2 years. Seventy-four participants completed treatment and the assessment immediately following it.

The researchers randomly assigned the participants to one of two treatment groups or a waiting-list control condition. The two treatment groups received treatment in small groups of 5–10 people 2 hours a week for 8 weeks. The small groups were led by clinical psychologists. Members of the operant group and their spouses or significant others received education about pain behaviors, well behaviors (e.g., exercise), and the role of social reinforcers in maintaining pain behaviors. Spouses or significant others were instructed to reinforce well behaviors and not to reinforce pain behaviors. Also, participants set behavioral goals in various areas affected by pain, and 5 times a week they engaged in a program of regular aerobic walking or jogging based on a system of increasing quotas. They kept records of their distance and their heart rate during exercise, and they discussed their progress and problems each week.

Members of the cognitive-behavioral group and their spouses or significant others received weekly training in systematic progressive muscle relaxation and imagery. They also practiced these techniques daily at home with audiotapes. Further, they learned “to identify negative emotions related to pain and stressful events and to identify associated distorted, maladaptive thoughts. They then learned to generate more adaptive alternate thoughts. [They] kept records of negative emotions, antecedent situations, automatic thoughts, and alternate rational responses between sessions and discussed these during sessions” (pp. 262–263).

Members of the control group received no treatment.

The researchers were interested in the following outcome areas: *pain severity* (as measured by the Pain Rating Index of the McGill Pain Questionnaire); *pain-related physical and psychosocial dysfunction* (as measured by the Sickness Impact Profile and the Pain Behavior Checklist, both completed by the participant and his or her spouse or significant other); *pain behaviors* (as rated by trained observers viewing videotapes of the participants); and *cognitive errors* (as measured by the Cognitive Errors Questionnaire). Assessments were made before treatment began, after treatment ended, and 6 and 12 months later.

What did the researchers find?

Immediately after treatment, all three groups showed **significant** (see *Glossary*) improvement overall. The operant group improved significantly more than the control group on the patient’s and the spouse’s or cohabitor’s reports of overall physical and psychosocial dysfunction (as indicated by the Sickness Impact Profile) and of pain behavior (as indicated by the Pain Behavior Checklist). The cognitive-behavioral group did **not** improve **significantly** (see *Glossary*) more than the control group on any measure, and it improved significantly less than the control group on the patient’s and the spouse’s or cohabitor’s reports of overall physical and psychosocial dysfunction (as indicated by the Sickness Impact Profile).

At the follow-ups, however, the operant group showed a leveling off in improvement, whereas the cognitive-behavioral group continued to improve. By the 12-month follow-up, members of both groups showed significant improvement, with little difference between the two.

What do the findings mean?

For therapists and other providers, the findings suggest that operant conditioning and CBT are equally effective in reducing physical and psychosocial disability in adults with chronic low-back pain.

What are the study’s limitations?

- The study was well controlled. The high rating (1) that it received on internal validity indicates that the outcomes were due to the interventions and not to some other factor.
- The possibility of individual differences among therapists who provided interventions for both groups was not taken into consideration in the analysis and conclusions.

GLOSSARY

nonsignificant (or no significance)—A statistical term that refers to study findings that are likely to be due to chance differences between the groups rather than to other factors (e.g., the treatment of interest). A nonsignificant result is not generalizable outside the study. Like significance, a nonsignificant result does not indicate the clinical effect. Often studies will show nonsignificant results, yet the treatment group’s mean will be better than the control group’s. This is usually referred to as a *trend in the right direction*. Because significance is closely determined by sample size, nonsignificant results would often become significant if the sample size were increased.

significance (or significant)—A statistical term that refers to the probability that the results obtained in the study are not due to chance but to some other factor (e.g., the treatment of interest). A significant result is likely to be generalizable to populations outside the study.

Significance should not be confused with clinical effect. A study can be statistically significant without having a very large clinical effect on the sample. For example, a study that examines the effect of a treatment on a client's ability to walk may report that the participants in the treatment group were able to walk significantly longer distances than the control. However, after reading the study one may find that the treatment group was able to walk, on average, 6 feet, whereas the control group was able to walk, on average, 5 feet. Although the outcome may be statistically significant, a clinician may not feel that a 1-foot increase will make his or her client functional.

■ Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: *Uniform Terminology for Occupational Therapy Practice—Third Edition* (AOTA, 1994) and *International Classification of Functioning, Disability and Health (ICIDH-2)* (World Health Organization [WHO], 1999). More recently, the *Uniform Terminology* document was replaced by *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), and modifications to *ICIDH-2* were finalized in the *International Classification of Functioning, Disability and Health* (WHO, 2001).

This work is based on the evidence-based literature review completed by Joyce M. Engel, PhD, OTR/L, FAOTA, with contributions from Amol Karmarkar, MS, OT.

For more information about the Evidence-Based Literature Review Project, contact the Practice Department at the American Occupational Therapy Association, 301-652-6611, x 2040.



Copyright 2005 American Occupational Therapy Association, Inc. All rights reserved.
This material may be reproduced and distributed without prior written consent.