Cognitive-behavioural approaches and chronic pain

The effectiveness of cognitive-behavioural interventions with people with chronic pain. A critical review of the literature by the Occupational Therapy Evidence-based Practice Research Group, McMaster University, Hamilton, Ontario.

Background

A cognitive-behavioural approach is used widely in interdisciplinary settings with people with chronic pain (Keefe, Dunsmore & Burnett, 1992; Turner & Chapman, 1982). Occupational therapists are usually part of the interdisciplinary team, and are interested in evaluating the outcomes of their interventions. Increased emphasis on evidence-based practice in health care makes it essential for occupational therapists, and other service providers, to base their practice on best evidence.

Literature describing a cognitive-behavioural approach for people with chronic pain has grown in the past decade. This approach is based on recent theoretical developments in cognitive and behavioural therapies (Turk, Meichenbaum & Genest, 1983). It focuses on both behavioural and cognitive components of chronic pain, teaching people with chronic pain about the relation of pain to cognitive, affective and physiological issues in order to help them reconceptualize their own ability to control pain. Cognitive-behavioural strategies teach skills to change the way that people cope with pain on a daily basis. The approach is multi-modal and usually includes treatment methods such as relaxation training, visual imagery, pacing, assertiveness training and goal-setting, as well as practice and consolidation of coping skills through role-playing and other behavioural techniques (Kerns, Turk & Hopzman, 1983).

Research on the effectiveness of cognitive-behavioural intervention for people with chronic pain has increased as this approach has been incorporated into health care practice. Articles published in the early 1980s reported on laboratory pain studies and the evaluation of new multidisciplinary treatment programmes that included a cognitive-behavioural approach (Kerns et al., 1993; Turner & Chapman, 1982). In the past 10 years, outcome studies have compared the effectiveness of a cognitive-behavioural approach with other well-known treatments for people with chronic pain (Basler, 1993; Keefe et al., 1992; Scheer, Watanable & Radack, 1997). Two review articles published in the 1990s examined cognitive-behavioural interventions for patients with chronic pain from different perspectives. Basler (1993) analyzed treatment effects of a cognitive-behavioural group programme for people with different forms of rheumatic disease and found that pain reduction was greatest in patients with low back pain and least in ankylosing spondylitis. Scheer et al. (1997) reviewed 12 studies utilizing non-surgical interventions for industrial low back pain, including cognitive-behavioural strategies, multidisciplinary pain clinics, exercise and others. They concluded that most of the studies had methodological limitations and called for more rigorous research. Linssen and Spinhoven (1992) found similar methodological problems in their review of existing studies on the multimodal treatment of chronic pain.

An exploration of research advances and future directions in the area of behavioural and cognitive-behavioural interventions for chronic pain was conducted by Keefe et al. (1992). They found that most outcome studies focused on comparing cognitive and behavioural interventions with control conditions, or testing the relative efficacy of two treatment methods. They found that no one treatment approach had a consistent advantage over the other, and suggested that further research is needed with larger populations and different chronic pain conditions (Keefe et al. 1992). No specific review of the effectiveness of cognitive-behavioural interventions alone for people with chronic pain was found in the literature. The need to critically review the research literature on the effectiveness of a cognitive-behavioural approach to chronic pain was thus identified.

Objectives

A critical review of the published literature was undertaken to determine the effectiveness of
cognitive-behavioural interventions with people with chronic pain. Specifically, we were interested in the reported effectiveness of cognitive-behavioural interventions in improving outcomes of interest to occupational therapists, namely occupational performance and/or performance components.

Our primary question was:
- What is the effectiveness of cognitive-behavioural interventions in improving occupational performance (function) for people with chronic pain?

A secondary question was:
- What is the effectiveness of cognitive-behavioural interventions in improving performance components, environmental components and/or pain-related outcomes for people with chronic pain?

Materials and Methods

Criteria for considering studies for this review

Types of studies
The systematic review selected randomized and quasi-randomized clinical trials which involved cognitive-behavioural approaches and adults with chronic pain.

Studies are in published literature, since 1982 (when cognitive-behavioural approaches were first described in the literature).

The descriptive critical review (see Table 1) included all articles which reported a study of the effect of cognitive-behavioural approaches with adults with chronic pain - the study designs included randomized controlled trials, cohort, before-after, single case, cross sectional, case control and case study.

Types of participants
Adults (ages 18 years and older)
Inpatient and outpatient
Chronic pain condition of at least 3 months duration, usually identified by physician or rehabilitation team.
Location of chronic pain can be in back, neck, upper or lower extremity, or as a result of a condition such as fibromyalgia, rheumatic disease (eg. RA), whiplash, headache.
Participants with acute or sub-acute pain, or chronic pain due to cancer are not included.

Types of intervention
Cognitive-behavioural interventions are multi-modal in nature and include at least 3 of the following modalities:
- relaxation
- stress management
- goal-setting/contracting
- self-monitoring/ self-talking
- assertiveness training
- modelling
- imagery
- pacing
- family training
Intervention can be either inpatient or outpatient.

Unimodal interventions, or approaches that are only behavioural or cognitive (not combined) are not included. Biofeedback, hypnosis, or other physical modalities on their own are also not included.

Articles which did not fully describe the treatment approach are not included.

Types of outcome measures
Outcomes should be clinically relevant to occupational therapists working with people with chronic pain. These outcomes include:
(a) occupational performance outcomes:
in general, such as participation in daily activities, and/or
in specific areas of self-care, productivity and/or leisure;
(b) performance component areas:
physical components
psychological components
cognitive components
pain-related behaviours and perceptions;
(c) environmental component areas, including family/caregiver perspectives.

Search strategy for identification of studies
Search strategies followed recommended procedures in the Cochrane Collaboration Handbook (Mulrow & Oxman, 1997).
1. Computer search - electronic databases:
Search of published literature using Medline, CINAHL, Abstracts, Psych Lit, Social Sciences Index, Health Star, for years 1966-present.
Review of Cochrane library.
2. Hand searching
Review of bibliographies and databases on cognitive-behavioural approaches and chronic pain supplied by field experts.
3. Citation review
Review of all reference lists of retrieved articles.
Science Citations review of all primary authors and studies included in this review, from 1995 to present.

The search involved combining keywords related to cognitive-behavioural interventions with different conditions and chronic pain.
Key words included:
cognitive-behavioural therapy/intervention
cognitive therapy/intervention,
behaviour therapy/intervention,
multimodal programs,
occupational therapy,
rehabilitation,
psychological factors, tw.
chronic pain, pain,
back pain, neck pain, fibromyalgia, rheumatic disease.
A final combination was done with the following text words:
effectiveness, treatment outcomes, validity, reliability, tw..

Methods of the review
(a) Article selection:
Lists of articles from the literature search were reviewed by two researchers for possible inclusion. Abstracts of articles were reviewed using the inclusion and exclusion criteria (above).

(b) Data abstraction:
Those articles that met the inclusion criteria were reviewed using forms and guidelines developed by the McMaster University Occupational Therapy Evidence-based Practice Research Group for critical appraisal of literature (Law et al., 1998). Data was descriptive and narrative in nature, and focused on the clinical relevance and quality of the study.
Six researchers reviewed articles in the initial phase, using the forms and guidelines, until agreement of 75% was reached. After this, one researcher completed the review.
A systematic review of articles that were experimental (RCT or quasi-experimental) in design was then conducted using guidelines for the preparation of a systematic review from the Cochrane Collaboration. A data collection form was developed specifically for this review to ensure that the data was extracted accurately from each article. Agreement of 75% was reached between 2 researchers for this form, after
Cognitive-behavioural approaches and chronic pain

which one researcher completed the data collection.

(c) Data analysis:
1. The descriptive review of the studies was outlined in table form, to summarize the important clinical and methodological issues for occupational therapists (see Table 1).
2. The data from the systematic review was entered into RevMan (Review Manager) software (Cochrane Collaboration, 1998). This software summarized the results of the individual articles into 2 main tables:
   - A description of the key characteristics of the included studies (Table 2);
   - A table of comparisons of the key outcomes of the studies (Table 3).

Description of studies
Studies included in this systematic review were randomized controlled trials or quasi-experimental in design. Sufficient data was reported in the article for RevMan analysis.
Of the 29 potential articles from the descriptive critical review, 10 were selected for this systematic review.

Methodological quality of included studies
Study quality was assessed using a Quality Scale developed by Jadad et al. (1996) (see appendices). The main components of the quality scale were:
- allocation concealment - judged as adequate, possibly adequate and inadequate;
- study design - randomized or not;
- masking of subject, assessor and provider;
- drop-outs/withdrawals reported.
An overall quality score was assigned for each article selected for the systematic review.

Results
1. Literature search:
The first round of searching using electronic data bases found over 1500 titles with the main key words related to interventions and conditions used.
Application of the inclusion and exclusion criteria narrowed this to 147 articles. Key words related to outcome studies, effectiveness, etc. resulted in selection of 51 articles for the initial, descriptive review.
Handsearching and citation reviews found 20 more articles that met inclusion criteria.
During the review process, many articles were excluded from the final list when they were read fully. The final number of accepted articles for this review was 29.

2. Data extraction and analysis:
(a) Descriptive review: Table 1 summarizes the important components of the accepted studies and provides an assessment of the main methodological issues and implications for occupational therapists.

(b) Systematic review:
Of the 29 studies included in the descriptive review, 13 were experimental or quasi-experimental in design. Three of these selected studies were subsequently excluded as they compared different forms of cognitive-behavioural treatment programmes. The final number of selected studies for systematic review was 10.
Table 2 outlines the key methodological characteristics of the 10 studies selected for systematic review following the Cochrane Collaboration guidelines, and the quality scale scores for each study.
Table 3 provides a summary of the key outcomes that were measured in two or more of the selected studies.

Discussion
The results of the descriptive review of 29 studies (table 1) appears to be positive for cognitive-behavioural approaches for people with chronic pain when compared with no treatment. However, the results are not as
positive when cognitive-behavioural approaches are compared with alternative, or other forms of treatment. Group treatment approaches appeared to be favoured over individual forms of treatment. Generally, it is difficult to make any strong conclusion about the effectiveness of cognitive-behavioural approaches from the descriptive review, as many of the studies used weak methodological designs.

The systematic review of 10 studies that used experimental or quasi-experimental designs found mixed results. Most of these studies used a randomized control (RCT) design to examine the effects of a specific treatment programme as compared with no treatment and/or compared with another form of treatment (several studies did multiple comparisons at once). Multiple outcomes were studied, which was problematic for the analysis and interpretation of this systematic review.

The results of the systematic review indicate favourable results for cognitive-behavioural intervention compared with control (waitlist or no attention) conditions in the short-term (that is, immediately after intervention). The strongest effects were found in the short-term outcomes of pain perception and pain intensity. Weaker effects that favoured cognitive-behavioural intervention over control conditions include activity level, depression and cognition.

When cognitive-behavioural interventions were compared with other/alternative forms of treatment, including standard medical care, physiotherapy, social support and hypnosis, the results were less supportive of the cognitive-behavioural approach alone. No short-term outcomes were found to be clearly in favour of cognitive-behavioural interventions. Over the long-term however (ranging from 6 - 18 months after intervention), some outcomes (depression, pain perception and family impact) did move in the direction of favouring cognitive-behavioural intervention, but the overall effects of these outcomes were not strong.

In summary, it appears that cognitive-behavioural intervention may be beneficial for people with chronic pain. This critical review of the literature demonstrates some positive outcomes of cognitive-behavioural intervention, particularly when compared with no intervention. However, the evidence from this review is not conclusive. It is difficult to draw conclusions when the studies are "muddied" with different types of cognitive-behavioural interventions and multiple outcomes. However, this appears to mirror the clinical world, as cognitive-behavioural interventions are seldom used on their own. They are usually part of a multi-disciplinary approach to the treatment of chronic pain.

Future research on the effectiveness of cognitive-behavioural interventions for people with chronic pain could focus on functional outcomes related to quality of life, and participation in activities, which are important aspects of the role of an occupational therapist. It would be advantageous to use the same functional outcomes across different studies to allow for comparison across studies and to increase the strength of the findings.

The Occupational Therapy Evidence-based Practice Research Group
School of Rehabilitation Science, Building T-16, McMaster University, 1280 Main Street West, Hamilton, Ontario, L8S 4K1.
Mary Law, Debra Stewart, Nancy Pollock, Lori Letts, Jackie Bosch, Muriel Westmorland, Angela Philpot.
Effectiveness of Cognitive-behavioural Interventions with People with Chronic Pain

References


APPENDICES:

TABLE 1: Descriptive Review of the Literature on Cognitive-behavioural approaches for people with chronic pain

TABLE 2: Characteristics of Included Studies for the Systematic Review using RevMan software

TABLE 3: Table of Comparison of outcomes with summary statistics and interpretation.

FIGURE 1: Validated Quality Scale
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<thead>
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<th>AUTHOR &amp; DATE</th>
<th>PURPOSE</th>
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<th>RESULTS</th>
<th>CONCLUSIONS &amp; IMPLICATIONS</th>
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<tr>
<td>Altmaier, E.M, et al. (1992)</td>
<td>- to evaluate the effectiveness of a psychological intervention vs. placebo control (physio only) for patients with chronic low back pain</td>
<td>- RCT design, with patients randomly assigned to one of the programs. Evaluations conducted pre-treatment, on discharge and 6-month follow-up. N=45 outpatients admitted to a Low Back Pain inpatient rehabilitation program</td>
<td>- multiple outcomes evaluated including “process” variables such as exercise endurance &amp; confidence, and program outcomes on 3 levels: disability, self-reported pain and life interferences. - inpatients assigned to either a placebo physio regime, 2x/day; or placebo plus operant conditioning, relaxation training, group and individual cognitive-behavioural training; 3 weeks duration.</td>
<td>- All patients showed improvements in outcome measures over time, but no stat. significant differences found re: improvements in functioning, return to work or pain interference in either group. 60% of patients in both groups returned to some form of employment - multiple outcomes were taken into account in the analysis.</td>
<td>- Both interventions were found to be somewhat effective in improving patient functioning. However, no significant differences were found between physio only and physio plus cognitive-behavioural strategies. - Short time period (3 weeks) may have influenced lack of significant results. - These findings were supported in other studies which found no significant differences in outcomes between different forms of treatment for chronic pain.</td>
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<td>Applebaum et al. (1988)</td>
<td>to compare the relative efficacy of cognitive-behavioural pain management with a symptom-monitoring control group for veterans with RA.</td>
<td>- RCT design, random assignment to either active treatment group or control group.  - evaluations conducted pre- and post-treatment and at 18-month follow-up.  - N=18 outpatients with RA, ranging from 1 to 39 years in duration.</td>
<td>- outcomes included psychological function, measured with a variety of standardized tools, pain intensity, arthritis symptoms, sleep patterns and daily activities.  - outpatient programme for 6 weeks; 10 trials of progressive relaxation, 10 trials of biofeedback and cognitive-behavioural pain management strategies, including self-monitoring, problem-solving. Symptom control group contacted once in 6 wks.</td>
<td>- statist. significant improvements noted in treated group in pain perception, control, coping, weekly pain ratings, total pain activity and joint range of motion.  - only 10/18 subjects assessed at 18-month follow-up: no statist. significant differences found between groups.</td>
<td>- Results found significant short-term improvements in pain perception and control, coping and ROM in a group of people with severe RA. These findings were similar to other studies.  - Limitations such as small sample size, multiple analyses, and large number of dropouts at follow-up make it difficult for OT’s to have confidence in these findings.</td>
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<td>Basler, Jakle &amp; Kroner-Herwig. (1997)</td>
<td>to evaluate the effect of cognitive-behavioural therapy and medical care vs. medical care only in patients with chronic low back pain.</td>
<td>- RCT design, comparing 2 treatments.  - evaluations conducted pre and post-treatment for both groups, and 6-month follow-up for cognitive-behavioural (C-B) group.  - N=76 patients with diagnosis of chronic low back pain, avg. duration of pain 10 years.</td>
<td>- outcomes included pain control, use of medication, coping, extent of disability and loss of work days.  - patients in both groups received medical treatment, TENS, and physical therapy. Patients in the C-B group received additional education, relaxation, and cognitive-behavioural strategies such as modifying thoughts and postural training. Treatment was provided for 12 sessions, in group format, 2.5 hours weekly.</td>
<td>- statistically significant changes in pre- post- scores found in outcomes of pain intensity, control over pain, avoidance behaviour, pleasant activities, catastrophizing, social roles, physical functions and mental performance.  - Gains made in the C-B group post-treatment were maintained at 6-month follow-up.  - number of work days lost decreased in the C-B group at 6-month follow-up, but this could not be confirmed due to drop-outs.</td>
<td>- Results indicate that a package of medical and cognitive-behavioural treatments is more effective than medical treatment alone, particularly in areas of pain control, coping ability and decreased disability.  - Limitations existed in large number of dropouts, and inability to mask patients to treatment allocation.  - Results are relevant for OT’s using cognitive-behavioural approaches in combination with traditional medical treatment.</td>
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<td>Bradley, Young et al. (1987)</td>
<td>- to evaluate the impact of 1 form of biofeedback-assisted cognitive-behavioural therapy (CBT) vs. social support for people with rheumatoid arthritis.</td>
<td>- RCT design, pre-post treatment and 6-month follow-up evaluation of 3 treatment groups: 2 forms of group therapy and a control group receiving no adjunct treatment. - N=53 (out of an initial 68) outpatients with RA. with avg. duration 11.5 yrs.</td>
<td>- outcomes of anxiety, depression, pain intensity and pain behaviours, health locus of control and physiological variables were assessed using a variety of self-report, behavioural and physiologic measures. - interventions were 15 sessions each: Cognitive-behavioural group therapy with biofeedback, or Structured social support group therapy.</td>
<td>- CBT group displayed significantly less pain behaviour, decreased pain intensity and unpleasantness, and decreased anxiety levels post-treatment. Anxiety reduction was maintained at 6 month follow-up. - relaxation seemed to be most important part of CBT clinically.</td>
<td>- Short-term benefits of CBT demonstrated in areas of pain behaviour and intensity and anxiety. - Identification of relaxation as most helpful strategy is important for OT’s. - Questions raised regarding long-term benefits based on lack of maintenance of benefits on follow-up evaluation.</td>
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<td>Cinciripini &amp; Floreen (1982)</td>
<td>- to report on the outcomes of an inpatient behavioural program for the management of chronic pain.</td>
<td>- before-after design, no control group. - pre- and post-treatment, and follow-up evaluations at 6 and 12 months post-discharge. - N=121 in-patients of Pain Control Centre, variety of pain sites, at least 1 year’s duration of pain.</td>
<td>- several measures of verbal/nonverbal pain behaviour, use of medication, and physical functioning obtained through observation pre-and post treatment, and self-report at follow-up. - 4 week in-patient program included medication reduction, physio, behavioural therapy, biofeedback, relaxation, self-monitoring, contracting, family training.</td>
<td>- over 90% of patients were free of all medication post-treatment - this reduced to 65% and 55% at 6- and 12-month follow-up. - statistically significant differences found post-treatment in observations of verbal and non-verbal pain behaviours, physical fitness, exertion and mobility. - follow-up reports indicated that changes made in the desired direction were maintained.</td>
<td>- Results are favourable for in-patient behavioural group program, but they are not conclusive due to lack of control group. - Multiple components of this treatment program make it difficult to determine which aspects may have resulted in the most benefit. - Lack of functional (OT-related) outcomes limit the applicability of study findings to OT practice.</td>
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<td>Cohen, Heinrich, Naliboff et al. (1983)</td>
<td>- to compare 2 outpatient group treatment methods for chronic low back pain</td>
<td>- before-after design, treatment-outcome study - comparing 2 groups, no random assignment, no control group. - N=25 outpatients with chronic low back pain of at least 6 months duration. - evaluations pre- and post-treatment, no follow-up.</td>
<td>- 4 domains of pain experience evaluated: physical abilities, physical functioning, psychological and psychosocial functioning, and pain intensity and perception. - 2 group interventions compared: physical therapy treatment and behaviour therapy, which included relaxation, guided imagery, goal setting, activity management, problem-solving and assertiveness training. Each group 10 sessions.</td>
<td>- significant improvements found in both treatment groups in terms of less pain, less activity limitations from pain, less psychological distress, and satisfaction with treatment. - PT group demonstrated improved low back control, but not generalization to daily activities; plus significant decrease in overall depression scores. - Behavioural group demonstrated a trend towards increasing social and physical activities, but not statist. significant.</td>
<td>- Weak support found for the hypotheses that group treatment would have similar outcomes in 4 domains of pain experience; differential effects for each type of treatment were minimal in this study. - Methodological flaws weaken strength of conclusions, in particular, no control group, small sample size. - Limited application to OT practice due to methodological weaknesses.</td>
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<td>Corey, Etlin &amp; Miller (1987)</td>
<td>- to evaluated a cognitive-behavioural treatment program for people with chronic pain, conducted in their homes</td>
<td>- before-after design, program evaluation, no control group. - N=72 subjects referred to one clinic; variety of diagnoses. All had not worked due to pain for a mean of 28 months. - evaluations conducted before and immediately after treatment, and one follow up, avg. 18 months after discharge.</td>
<td>- outcomes focused on work status.; pain reduction, functioning level and coping ability were reported subjectively by subjects post-treatment and on follow-up.</td>
<td>- 70% of subjects had returned to some form of work or re-training immediately after treatment and on follow-up. - Subjective reports of pain reduction indicated that subjects who returned to some form of work reported a mean percent of pain reduction of 32 - 79%, as well as a range of 27 - 77% increase in functioning and 27 - 82% increase in coping ability. In comparison, those subjects not working reported a range of 2.5-11% pain reduction, 3-7% functioning increase, and 6-8% increase in coping.</td>
<td>- Outcomes indicate positive benefits of a cognitive-behavioural programme for people with chronic pain. - Results are not conclusive due to weak methodology, no control group. - Self-report measures were found to be highly associated with a more objective measure of functioning - work status. - Strengths of programme are worthy of OT’s attention: home setting, involvement of families, individualized treatment and focus on activity.</td>
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<td>Edelson &amp; Fitzpatrick (1989)</td>
<td>- to examine the effectiveness of cognitive-behaviour therapy and hypnosis, versus attention control, for people with chronic pain.</td>
<td>- weak RCT design: assignment to 3 treatment groups was done sequentially as patients were referred. - evaluations were conducted pre-treatment, post-treatment, and 1 month after treatment. - N=27 males with chronic pain (min. 6 months), multiple sites: 24 outpatients, 3 inpatients.</td>
<td>- outcomes focused on 2 categories of pain behaviour: overt motor behaviour (activities) and cognitive-verbal behaviour. - Cognitive-behaviour therapy included self-instruction, education, imagery, and self-talk. Hypnosis presented same information after a standard hypnotic induction. Control group received attention through non-directive therapy. - both groups 2 weeks, 4 sessions.</td>
<td>- statistically significant differences were found in 2 areas: amount of walking/standing and amount of sitting, for subjects in the cognitive-behaviour (CB) group. Differences were sustained at 1-month follow-up. - no statistically significant differences found in pain intensity or pain rating in treatment groups, but trends favoured the CB group for pain intensity, and the hypnosis group for pain rating.</td>
<td>- Results show weak support for cognitive-behaviour therapy improving activity levels of people with chronic pain. - Small sample size may have limited power to detect change in more subjective pain behaviours. - Limited application to OT as we aren’t involved in hypnosis.</td>
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<td>Flor &amp; Birbaumer (1993)</td>
<td>- to compare 3 types of treatments for chronic musculoskeletal pain (low back pain and temporomandibular (TMJ) joint pain)</td>
<td>- before-after design, comparing efficacy of 3 different treatments. - N=78 outpatients with chronic (more than 6 months duration) low back pain or TMJ pain, assigned to 1 of 3 treatment groups. - evaluations conducted pre and post-treatment, 6 and 24 month follow-up.</td>
<td>- outcome measures were organized into 3 main areas: verbal-subjective, behavioural and psychophysiological outcomes. - 3 types of treatment: 1. EMG-biofeedback: 8x60 minute sessions, with homework exercises; 2. Cognitive-behavioural (CBT) sessions, same number as EMG, including pain &amp; stress managements, relaxation, problem solving and coping skills; 3. Medical (MED) intervention, variable duration, including meds, chiropracty, nerve blocks, etc.</td>
<td>- statistically significant improvements noted post-treatment in verbal-subjective areas of pain severity, catastrophizing pain and activity interference for EMG group compared to subjects in CBT or MED groups; follow-up scores at 6 and 24 months showed improvements were more pronounced in pain severity and activity interference in EMG group. Coping skills and life control scores significantly lower in EMG group. Number of health care visits was significantly lower for subjects in EMG group only at 24 months follow-up.</td>
<td>- Results demonstrated that EMG biofeedback may be a superior treatment for people with mild chronic musculoskeletal pain. EMG treatment included a stress management component in this study, which may have influenced outcome. CBT treatment was found to be only marginally efficacious, which could be related to the short duration of treatment. - Limitations included large number of outcome measures, assessors not masked. - Most noticeable treatment effects found at 6 and 24 month follow-up, which supports the evaluation of long-term benefits.</td>
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<td>Heinrich, Cohen, Naliboff et al. (1985)</td>
<td>- to study the impact of behaviour and physical therapy on different components of chronic low back pain</td>
<td>- before-after design, treatment-outcome study, comparing 2 types of treatment. No control group. - evaluations completed pre and post-treatment and follow-up times of 6 months and 1 year. - N=33 patients with chronic low back pain (6 months or more) referred to clinic - assigned to treatment group by order of entry.</td>
<td>- outcomes focused on 4 areas of functioning: physical abilities, current physical functioning, psychological and psychosocial functioning, pain intensity and pain perception. - treatments conducted in group outpatient setting for 10 weekly sessions. Behaviour therapy utilized education and training in self-responsibility, personal effectiveness, pain control, goal setting and activity management.</td>
<td>- statistically significant improvements found in both treatment groups in pain ratings, depression and anxiety at post-treatment and 6-month evaluations. Overall ratings of improvement on the post-treatment interview were similar for the 2 groups. - physical therapy group improved in low back control on post-treatment and 6-month evals, and in back protection manoeuvre at post-treatment time only.</td>
<td>- Results indicate that physical therapy increases low back control and back protection techniques. No advantage was found in behaviour therapy over physical therapy on psychosocial measures, as both groups showed improvements. Group format may have had a positive influence. - Results not conclusive due to lack of control group, small sample size. Limited application to O.T. practice.</td>
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<td>Jensen et al. (1997)</td>
<td>- to evaluate whether a cognitive-behavioural treatment designed specifically for women with chronic spinal pain is more effective than a regular cognitive-behavioural approach.</td>
<td>- RCT design, comparing two treatment groups. - evaluations conducted pre-treatment, immediate post-treatment, 6- and 18-month follow-up. - N=54 women with non-specific spinal pain, chronic in nature.</td>
<td>- variety of outcomes including sick leave, pain intensity/anxiety, depression, perceived helplessness, coping strategies, disability rating. - regular multi-modal cognitive-behavioural treatment (MMCBT) using a team approach, included exercise, education, problem solving, relaxation, goal setting and self-efficacy training. Gender-specific program had added component of psychologist-led group sessions focusing on gender-specific behaviour. Both treatments were inpatient, 5-week duration, 8 hours per day.</td>
<td>- the only stat. significant difference between groups was in level of disability, with the experimental group showing an decrease compared with regular treatment. Some significant differences were seen in depression at the 6-month follow-up only. These gains were not maintained at 18-months, and there were no significant differences in sick leave or overall health and well-being.</td>
<td>- results were inconclusive due to low power of study - small sample size. - results did not support the development of a gender-specific multi-modal cognitive-behavioural treatment programme. - no O.T. involved in the team approach, therefore direct implications for O.T.’s are limited.</td>
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<td>Kerns et al. (1986)</td>
<td>- to investigate the clinical efficacy of behavioural and cognitive-behavioural treatments for outpatients with chronic pain.</td>
<td>- RCT design, with 2 treatment conditions and 1 waiting list control condition. - evaluations conducted pre- and post-treatment, and at 3 and 6 month follow-ups. - N=28 outpatients with different types of chronic pain of at least 6 months duration.</td>
<td>- multidimensional outcomes of pain experience, including pain intensity, impact of activities, depression, anxiety, health locus of control, as well as use of health care system and individualized treatment goals. - subjects randomized to one of 3 groups: Cognitive-behavioural therapy, Behavioural treatment, or Waiting list control. Each group lasted 10 weeks.</td>
<td>- statistically significant improvement found in the cognitive-behavioural group for all 4 components of pain measures: affective distress, pain severity, activities, and dependency, as well as an overall improvement in this group, at post-treatment and 3-month follow-up. Marginal improvement maintained at 6-month follow-up. No significant effect found for behavioural group at any time.</td>
<td>- Improvements demonstrated in outpatients receiving cognitive-behavioural therapy on a set of multidimensional variables relevant to pain, including severity, affective state, activities and dependency - these improvements were maintained over a short term (3 months). - Generalizability of results are limited due to small sample size and drop-outs. - Results are applicable to OT’s working with people with chronic pain.</td>
</tr>
<tr>
<td>Newton-John, Spence &amp; Schotte (1995)</td>
<td>- to determine the efficacy of cognitive-behavioural therapy vs. EMG biofeedback in the treatment of chronic low back pain</td>
<td>- before-after design - subjects assigned to either CBT therapy or EMG biofeedback. - N=44 convenience sample, chronic low back pain of more than 6 months duration.</td>
<td>- multiple outcomes organized into 2 main areas: pain-related outcomes and mood-related outcomes. Seven different measures used. - group treatment for both forms of intervention, 8 - 1 hour sessions, twice per week. CBT therapy included education, goal-setting, activity scheduling, relaxation, cognitive restructuring techniques. Wait list control group.</td>
<td>- stat. significant improvements found for both types of treatment (vs. Wait list control) in outcomes of pain intensity, perceived level of disability and depression, immediately after treatment and at 6-month follow-up. Decreased anxiety and increased coping skills noted but not stat. significant. No differences found between the 2 types of treatment.</td>
<td>- Results indicate both forms of treatment (CBT and EMG biofeedback) can be efficacious in reducing pain intensity, perceived level of disability and depression. - Results are not generalizable to other populations due to small sample size.</td>
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<td>Nicholas, Wilson &amp; Goyen (1991)</td>
<td>- to examine the relative efficacy of operant-behavioural vs. Cognitive-behavioural group treatments, with and without relaxation, compared with 2 control conditions.</td>
<td>- RCT design: assignment to 1 of 6 experimental conditions - 4 treatment groups and 2 control groups. - 6 conditions x 4 trials. - repeated measurements at pre and posttreatment, 6 and 12 months. - N = 58 patients from pain clinic, chronic back pain at least 6 months.</td>
<td>- outcomes included pain rating, anxiety and depression, pain beliefs, coping strategy, health status, medication intake and follow-up evaluation of treatments. - 4 treatment groups (5 weeks each): cognitive-behavioural with and without relaxation, operant-behavioural with and without relaxation. 2 control conditions: with and without attention (discussion group). All groups received physio.</td>
<td>- stat. significant improvements in all treatment groups on measures of affective distress, functional health status, meds use, pain-related dysfunction and coping : maintained at 6 and 12 months. - operant-behavioural group improved more on self-reported Sickness Impact Profile, but this was not maintained at 6 and 12 months. - Relaxation added little to overall benefit.</td>
<td>- Results lend support to the use of both types of treatment with relaxation for patients with chronic low back pain. Similar findings to other studies using the Sickness Impact Profile as outcome measure. - Problems with drop-outs limits confidence in findings. - Interesting results for OT’s using a variety of cognitive-behavioural treatment modalities.</td>
</tr>
<tr>
<td>Nicholas, Wilson &amp; Goyen (1992)</td>
<td>- to investigate the relative efficacy of cognitive-behavioural treatment with a physio back-education/exercise program. - also to use a new measure of pain self-efficacy.</td>
<td>- RCT design, with 2 treatment conditions: cognitive-behavioural therapy combined with physio and an “attention-control” condition receiving physio only. - evaluations conducted pre and posttreatment and at 6-month follow-up. - N=20 outpatients with chronic low back pain (6 months).</td>
<td>- 8 outcome measures employed to evaluate impact of treatment on pain, depression, coping, health and activity status, medication use, and pain self-efficacy. - 2 treatment conditions, each in groups of 5 patients for 5 weeks. Both conditions included standard physio. Cognitive-behavioural treatment included medication reduction, goal setting, relaxation and activity pacing.</td>
<td>- statistically significant improvement found on post-treatment and 6-month follow-up scores for the Sickness Impact Profile (other), Coping Strategies, and Pain Self-efficacy for the combined cognitive-behavioural and physio group. A decrease in medication use was significant post-treatment, but was not maintained at follow-up.</td>
<td>- Study indicates that combined cognitive-behavioural and physio treatment can result in improvements in psychosocial function, coping and pain self-efficacy, particularly in the short-term. - Small sample size limits the generalizability of conclusions, but the results are worthy of OT’s attention.</td>
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<td>Nielson, Walker &amp; McCain (1992)</td>
<td>- to evaluate the efficacy of inpatient cognitive-behavioural treatment for persons with fibromyalgia syndrome (duration not specified).</td>
<td>- before-after design, “quasi-experimental” programme evaluation. - subjects acted as own wait-list controls - assessed at 2 time intervals before entering treatment, 5 months apart, then post-treatment. - N=25 patients consecutively selected from outpatient department.</td>
<td>- multidimensional outcome measures of pain and psychosocial functioning were divided into “target” (expected to change with treatment) and “nontarget” (not expected to change) to assess potential demand characteristics. - in-patient cognitive-behavioural programme ran for 3 weeks and included relaxation training, cognitive techniques, exercises, pacing, and family education.</td>
<td>- no changes were found in either the target or nontarget response measures during the 5 month wait-list period. - comparison of pretest and posttest scores indicated that the target variables, but not the nontarget variables, changed in the expected direction (statistical significance achieved). Target variables were: pain severity, perceived interference with life, sense of control over pain, emotional distress, and pain behaviours.</td>
<td>- Encouraging results demonstrated significant improvement in targeted pain behaviours and psychosocial function for people receiving cognitive-behavioural therapy on an inpatient basis. - Limited generalizability due to small sample size and short time frame. - Findings relevant to OT’s working on inpatient programmes.</td>
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<td>O’Leary et al. (1988)</td>
<td>- to evaluate the effects of a cognitive-behavioural treatment on pain, physical function, other arthritis outcome variables, and immune function for people with RA.</td>
<td>- RCT design - treatment group and control group. - evaluations conducted pre- and post-treatment, no follow-up. - N=30 female patients with RA, (avg. duration 8 years), matched in pairs by pain level and meds. and randomly assigned to treatment or control group.</td>
<td>- multiple outcome measures used to evaluate arthritis outcomes, self-efficacy to manage pain, psychological functioning and immunological assays. - cognitive-behavioural treatment took place in groups for 5 weeks. Treatment included pain-management strategies and goal-setting, with self-reward to increased activity. Both groups received a copy of The Arthritis Handbook.</td>
<td>- statistically significant improvements found in the treatment group in pain intensity, joint impairment, self-efficacy to manage pain and other effects of arthritis. Treatment group also reported less depression and increased coping, but not statistic. significant. Immunological rates did not change. - significant relationships found between higher levels of perceived self-efficacy and pain reduction, increased coping and reduced joint impairment.</td>
<td>- Significant improvements in pain perception and perceived self-efficacy to manage pain and other arthritis symptoms were achieved in a cognitive-behavioural (C-B) treatment programme. - Interrelationships found between self-efficacy, pain levels, psychosocial functioning and joint impairment. - Large number of measures reduces confidence in results - Results, in particular info about perceived self-efficacy, of interest to OT’s.</td>
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<td>Parker et al. (1988)</td>
<td>- to examine the effectiveness of a cognitive-behavioural pain management program for people (veterans) with RA.</td>
<td>- RCT design, random assignment to 1 of 3 groups: CB treatment, attention-placebo group, and control group.</td>
<td>- variety of outcomes included pain perception, coping, depression and other affective variables, arthritis status, impact and helplessness.</td>
<td>- group receiving cognitive-behavioural programme improved significantly in pain coping scores at 6-month follow-up, in particular, diverting attention from pain, catastrophizing pain less, increased control over pain and ability to decrease pain. Improvements showed greater stat. significance at 12-month follow-up.</td>
<td>- For this sample of people with RA, a cognitive-behavioural programme demonstrated significant improvements (maintained over long term) in pain coping variables, but not in psychosocial variables. - Subjects with high adherance to programme regime demonstrated the most significant improvements, which is important information for OT’s.</td>
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<tr>
<td>Philips (1987)</td>
<td>- to evaluate the impact of an outpatient behavioural treatment program on people with diverse chronic pain problems.</td>
<td>- RCT design, treatment group and wait-list control group, evaluated pre- and post-treatment, and at 2- and 12-month follow-up points.</td>
<td>- outcomes focused on pain behaviour and impact of pain on daily functioning (subjective experience), plus patient and therapist perceptions of treatment effects.</td>
<td>- statistically significant changes in all measures except behavioural complaint in the treatment group, with no changes found in the control group, at post-treatment. Strongest effects occurred in affective components, depression and reduction in avoidance behaviour. Improvements were sustained at 2-month follow-up and more pronounced at 12 months. -Medication use was significantly reduced immediately post-treatment, but this was not maintained at follow-up.</td>
<td>- Sell-designed study demonstrated significant improvements in self-efficacy and control over pain for people involved in an outpatient behavioural therapy group. The nature of improvements were analyzed in terms of affective reaction to pain, reduced depression, and avoidance behaviour. These changes appear to influence long-term attitudes towards pain. - Findings important for OT’s working with people with chronic pain.</td>
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<td>Richardson, Richardson et al. (1994),</td>
<td>- to examine the effectiveness of cognitive-behavioural pain management course on employment status and quality of work.</td>
<td>- before-after design, program evaluation.</td>
<td>- employment outcomes included changes in work status and quality of work. Other measures included Sickness Impact Profile, Depression Inventory, State-Trait Anxiety Inventory, Pain Self Efficacy Questionnaire, Pain inventory and rating scale.</td>
<td>- significant improvement found in depression, confidence, pain-related distress and overall impact of pain in “workers” group. No signif. change noted in anxiety, pain intensity or walking.</td>
<td>- Findings support benefits of 1 programme in terms of affective state, pain distress and impact on activities, however impact on work status was variable. - Positive changes were noted in most measures of impairment from pre to post treatment, but results must be interpreted with caution as there was no control group and multiple outcomes.</td>
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<tr>
<td>Skinner et al. (1990)</td>
<td>- to investigate the efficacy of an inpatient cognitive-behavioural program for patients with chronic pain.</td>
<td>- before-after design, program evaluation.</td>
<td>- variety of outcomes including depression, anxiety, pain responsibility, pain response, locus of control and meds. use. - outpatient program, 7 weeks, included coping skills, goal-setting, relaxation and exercises.</td>
<td>- significant changes after treatment found in measures of meds. use, anxiety, depression, physical disability and coping skills. No changes noted in pain intensity. - patients showed no significant change during baseline pre-treatment period, supporting the treatment program’s effects.</td>
<td>- Study supports benefits of an outpatient program on affective state and coping skills for people with chronic pain. Similar findings to inpatient program studies, demonstrating that out-patient services may be equally effective. This is an important implication for OT’s. - Lack of control group limits confidence in findings.</td>
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<td>Spence, S.H. (1989)</td>
<td>- to investigate the effectiveness of group vs. individual cognitive-behaviour therapy (CBT) for people with chronic, work-related upper limb pain.</td>
<td>- RCT design: subjects allocated to one of 3 groups: individual CBT, group CBT, or wait list control group. - repeated measures evaluation pre- and post-treatment and 6 month follow-up. - N=45 outpatients with chronic pain (more than 6 months) in the upper limb; 44/45 females; work-related injuries.</td>
<td>- variety of pain-related and psychological outcomes including depression, anxiety, coping strategies, pain ratings and sickness impact. - 9 week program, either group or individual sessions each 1.5 hours per week. Major components were goal setting, cognitive restructuring, coping skills and pain management, assertion skills training and relaxation.</td>
<td>- subjects in both group and individual CBT showed stat. significant improvements on all outcome measures, with little difference between the 3 types of treatment. Wait list controls showed no improvement. Therapy gains were maintained at 6-month follow-up, with no stat. significant differences between types of treatment. - client evaluation ratings favoured individual CBT treatment.</td>
<td>- Results indicate that CBT intervention is better than no intervention for people with chronic work-related upper limb pain, in psychological and pain-related outcomes. - Individual treatment was preferred by clients, but benefits of individual treatment vs. group treatment were the same statistically in outcome measures.</td>
</tr>
<tr>
<td>Spence, S.H. (1991)</td>
<td>- 2 year follow-up study to previous research comparing the effectiveness of group vs. individual cognitive-behavioural therapy (CBT) for chronic, work-related upper limb pain.</td>
<td>- same RCT design and sample as previous study. - 2-year follow-up evaluation. - N=19 of the original 45 subjects involved in first study.</td>
<td>- same outcome measures as previous study. - follow-up evaluation of group vs. individual CBT vs. wait-list control.</td>
<td>- stat. significant improvements in depression, coping, sickness impact-other, pain index and distress. Some relapse was found from post-treatment levels in scores of positive coping strategies. - minimal differences found between individual and group CBT: group CBT showed continued improvement in self-reported pain and activity interference, but individual CBT did not.</td>
<td>- Long-term benefits of CBT found for people with chronic, work-related upper limb pain, as psychopathology was reduced and coping abilities enhanced. Very few subjects reported being pain-free. - Group CBT was found to be as effective as individual CBT, and is more cost-effective.</td>
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<td>Turner (1982)</td>
<td>- to evaluate the effectiveness of group progressive-relaxation vs. Cognitive-behavioural (C-B) group therapy for people with chronic low back pain.</td>
<td>- RCT design, assignment to 1 of 3 conditions: relaxation group alone, relaxation with C-B group therapy, or control group. - measurements pre- and post-treatment, 1 month, and 2-year mail follow-up. - N=34 outpatients with chronic low back pain, 6 months or more duration.</td>
<td>- outcomes included physical and psychosocial dysfunction, meds. use, depression, pain severity, self-ratings of improvement. 2 year mail follow-up focused on work status, health services use, meds and pain severity. - 5 weekly sessions with 5-7 patients per group: 1. progressive-relaxation alone; 2. relaxation with C-B strategies; 3. Wait-list control with weekly phone call.</td>
<td>- both treatment groups showed statistically significant improvement in depression, physical and psych. functioning and pain rating. C-B group also improved significantly on daily pain ratings &amp; pain tolerance, and showed continued improvement on all measures at 1 mo. follow-up. - decreased health care use in both groups at 2 year follow-up.</td>
<td>- Evidence provided that both types of treatment result in improvement in physical and psych. function, depression and perception of pain. Cognitive-behavioural treatment demonstrates long-term benefits for people with mild chronic low back pain. - Study supports use of cognitive-behavioural and relaxation therapy in an outpatient group format, although sample size was small.</td>
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<tr>
<td>Turner &amp; Jensen (1993)</td>
<td>- to study the effects of outpatient group cognitive therapy, relaxation training and combined cognitive and relaxation therapy for people with chronic low back pain.</td>
<td>- RCT design of 3 treatment conditions (relaxation alone, cognitive alone, combined relaxation and cognitive therapies) and 1 control (wait-list) condition. - repeated measures pre- and post-treatment, 6- and 12-month follow-up. - N=102 outpatients with low back pain of more than 6 months.</td>
<td>- 4 main outcomes: pain intensity, sickness impact (physical and psych. functioning), depression, cognitive errors; and 1 process measure using videotapes of pain behaviours. - group treatments, weekly for 6 weeks, 5-10 patients per group: 1. Relaxation training group; 2. Cognitive therapy; 3. Combined cognitive/relaxation training. Control group on wait-list.</td>
<td>- subjects in all 3 treatment groups improved significantly in self-reported pain intensity, and showed decreases in cognitive errors. These improvements were maintained at 6 and 12 month follow-up. Other outcome measures did not show any statistically significant differences.</td>
<td>- Results provide some evidence that cognitive therapy and relaxation training are equally effective in reducing pain. - Insufficient power in this study may have resulted in lack of detection of differences in other outcomes. - Results support group treatment format for OT’s working with patients with chronic pain.</td>
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</table>
| Turner & Clancy (1988) | To evaluate and compare operant-behavioural and cognitive-behavioural approaches for the treatment of chronic low back pain. | - RCT design, assignment to 1 of 2 treatment groups or a control group.  
- repeated measures pre and post-treatment and 6- and 12-month follow-up.  
- N=81 subjects with chronic low back pain, more than 6 months duration. | - outcome measures included Pain Questionnaire, videotapes of pain behaviours, pain behaviour checklist,  
Sickness Impact Profile, and Cognitive Errors Questionnaire.  
- out-patient treatment groups run 1x/week for 8 weeks: operant-behavioural or cognitive-behavioural approaches. Control group on wait-list. | - stat. significant improvements on Sickness Impact Profile, cognitive errors and pain behaviours in both treatment groups.  
Improvement greater in operant-behav.. group immediately post-treatment, but cognitive-behav. group continued to improve at 6- and 12-month follow-up to even out.  
Cognitive-behav. group were more satisfied with treatment. | - Both types of behavioural treatment resulted in short and long-term improvement in multiple aspects of chronic pain - patterns of improvement varied with operant-behav. treatment showing immediate improvement and cognitive-behav. showing steady improvement over time.  
- Well-designed study supports both types of treatment for people with mild low back pain. |
| White & Nielson (1995) | Follow-up study to previous research on short-term effects of CB treatment with persons with fibromyalgia (see Nielson, Walker & McCain). | - quasi-experimental design, repeat of earlier study with 25 inpatients with fibromyalgia  
- follow-up evaluation at a mean of 30 months after discharge | - same “target” and “non-target” outcomes as first study. Target outcomes (variables which the program addressed) included pain severity, control, activity interference emotional/affective status and observed pain behaviour.  
- same treatment program as previous study. | - 3/10 target variables remained statistically different from pretreatment: worry, observed pain behaviour, and control over pain. All other target variables changed in the direction of improvement, but were not statistically significant.  
- non-target variables did not show any significant difference, as expected. | - Improvements found at follow-up support a cognitive-behavioural approach for people with fibromyalgia.  
- Limitations included small sample size, no control group, cointervention of medication use. Results are not generalizable based on these limitations, but show promise. |
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<tr>
<td>Williams et al. (1993)</td>
<td>- to evaluate an inpatient cognitive-behavioural programme for patients with chronic pain.</td>
<td>- prospective, longitudinal study using a before-after design. - evaluation conducted pre-treatment, 1 and 6 months after treatment. - N=212 inpatients with a variety of chronic pain conditions, mean duration 10.5 years.</td>
<td>- outcome measures included pain rating scale, pain self-efficacy scale, Sickness Impact Profile, Beck Depression Inv., mobility activities, and medication use log. - inpatient programme run for 4 weeks. Components included teaching behavioural and cognitive skills, goal setting and pacing, relaxation, exercise and meds reduction.</td>
<td>- statis. significant improvements found at 1 and 6 month follow-up times in mean scores of psych. dysfunction, depression, fitness, pain self-efficacy and pain distress. No significant change in pain intensity. High percentage of subjects reduced medication use.</td>
<td>- Improvements found in physical and psychological functions after an inpatient CB programme. - No definite conclusions can be made due to lack of control group, but findings are positive and similar to other studies. - Findings are relevant to OT’s working with people with chronic pain on an inpatient basis.</td>
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<td>Young, Bradley &amp; Turner (1995).</td>
<td>- to report on the efficacy of a cognitive-behavioural intervention in reducing the number of RA-related clinic visits and days hospitalized over an 18-month period.</td>
<td>- follow-up to an earlier study (see Bradley et al., 1987) which compared cognitive-behavioural (CB) treatment with social support (SS) group treatment or no treatment (control). RCT design used in original study. - N=53 patients with RA involved in original study, unclear if there were any drop-outs for this follow-up part.</td>
<td>- health care resource utilization was evaluated through a review of financial records from the local hospital and outpatient clinic. Measures included duration of inpatient admission for RA, charges associated with hospitalization, number of outpatient visits related to RA and clinic charges associated with each clinic visit. The unit of time was 6-month periods, before treatment, 6 months immediately following treatment, and 7-12 months after treatment.</td>
<td>- patients in the cognitive-behavioural (CB) group had 13.1% fewer clinic visits than patients in either the social support or control groups. Clinic charges were reduced by 16.9% in the CB group compared with a 2.0% reduction in the SS group and a 17.5% increase in the control group. - Relative reductions in inpatient hospital days were also found in the CB group (-72.3%) compared with the social support (-28.3%) or control (+3.9%) groups. CB group inpatient charges declined progressively over the 12 month follow-up.</td>
<td>- This follow-up study indicates that participation in a cognitive-behavioural intervention is associated with reduction in health care resource utilization, and costs. These results are clinically significant, however statistical significance was not established. - Cost-benefit analysis of cognitive-behavioural treatment demonstrated economic benefits of this approach.</td>
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### Characteristics of Included Studies

The effectiveness of cognitive-behavioural interventions with people with chronic pain. A critical review of the literature by the Occupational Therapy Evidence-based Practice Research Group, McMaster University, Hamilton, Ontario.

<table>
<thead>
<tr>
<th>Study</th>
<th>Method</th>
<th>Participants</th>
<th>Interventions</th>
<th>Outcomes</th>
<th>Notes</th>
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<tr>
<td>Altmaier 1992</td>
<td>Randomized controlled trial.</td>
<td>n=45 adults age range 25-58 years, mean age 40 years</td>
<td>Standard inpatient program included physiotherapy, fitness training, education and vocational rehabilitation. Additional psychological program included cognitive-behavioural interventions of operant conditioning, relaxation, biofeedback, and coping strategies</td>
<td>Pre-treatment, post-treatment and 6-month follow-up.</td>
<td>45/47 subjects completed study. No control group available for follow-up evaluation.</td>
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<td>Allocation concealment not described. Subjects and providers not masked to group assignment. Assessor masking unclear. Drop-outs were reported.</td>
<td>33 males, 12 females inpatients of one rehabilitation program low back pain with duration ranging from 3 - 30 months 2 groups were equivalent on initial outcome measure scores and demographics using chi-square and t-tests.</td>
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<td>1. Pain intensity, measured by McGill Pain Questionnaire (MPQ) (PPI part)</td>
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<td>2. Pain perception, measured by MPQ (PRI part)</td>
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<td>3. Control, measured by self-control subscale of West Haven Yale Multidimensional Pain Inventory (WHYMPI)</td>
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<td>4. Activity level, measured by WHYMP</td>
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<td>5. Physical abilities, measured by Low Back Pain Rating Scale (LBP)</td>
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<td>6. Return to full or part-time employment, measured by self-report.</td>
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<tr>
<td>Applebaum 1988</td>
<td>Randomized controlled trial.</td>
<td>n=18 participants age range 43 - 76 years 16 male, 2 female outpatients of Veterans Hospital Stages II and III rheumatoid arthritis, duration range 1 - 39 years 2 groups were equivalent on demographics except treatment group had longer duration of RA (mean 20 years vs. 9.3 years for control group).</td>
<td>Active treatment included cognitive pain management strategies, relaxation training and biofeedback. Individual treatment format, with homework. Symptom monitoring used diary. 6 week duration, 10 trials for active treatment.</td>
<td>Pre-treatment, post-treatment, 18-month follow-up.</td>
<td>Only 10/18 subjects available at follow-up (6 treatment, 4 control). Insufficient data (no standard deviation scores) at follow-up for analysis.</td>
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<td></td>
<td>Allocation concealment not described. Subjects and providers not masked. Assessor masking unclear. Drop-outs reported.</td>
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<td>1. Pain intensity, measured by weekly diary, rating scale.</td>
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<td>2. Pain behaviours and perception measured by McGill Pain Questionnaire (MPQ).</td>
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<td>3. Anxiety, measured by State-Trait Anxiety Inventory</td>
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<td>4. Depression, measured by Beck Depression Inventory</td>
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<td>5. Activity level, measured by Daily Activities Questionnaire</td>
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<td>6. Control, measured by Response to Arthritis and Pain Questionnaire</td>
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<td>7. Physical abilities, measured by PT Assessment.</td>
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<td>8. Sleep, measured by sleep</td>
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<tr>
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<td>Interventions</td>
<td>Outcomes</td>
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<tr>
<td>Bradley 1987</td>
<td>randomized Trial allocation concealment unclear</td>
<td>n=53 subjects mean age 50.09, 10 male, 43 female pain duration 11.49 years average rheumatoid arthritis - 5 in class 1, 28 class 2 and 20 class 3.</td>
<td>Group and individual sessions mixed, outpatient basis 15 sessions in total for each condition. 1. Cognitive-behavioural treatment, with education, relaxation, goal-setting, self rewards and individual biofeedback training. 2. Structured social support in small groups with family, included education and coping strategies. 3. Control group - &quot;no adjunct therapy&quot;.</td>
<td>Pre-treatment, post-treatment, 6 month follow-up 1. Trait form of State-Trait Anxiety Inventory 2. Depression Adjective Checklist 3. Health Locus of Control 4. Arthritis Helplessness Scale 5. Videorecording of pain behaviour 6. Physiological tests of skin temp., grip strength, RA factor titers and SED rates.</td>
<td>15 drop-outs reported, reasons reported, but unclear if they analyzed if drop-outs were different in any way. Follow-up study conducted by Young, Bradley et al. (1995) on Health Care Utilization.</td>
</tr>
<tr>
<td>Edelson 1989</td>
<td>quasi-experimental design (not randomized)</td>
<td>n=27 subjects at start of study mix of inpatients (3) and outpatients, all male, multiple pain sites, including back (7), pain duration mean 9 years</td>
<td>1. cognitive-behavioural sessions, included verbalization, alteration of thoughts, self-instruction and imagery; 2. cognitive-behavioural plus hypnosis 3. attention control, non-directive sessions with therapist. All sessions were individual, 4 x 1 hour each for 2 weeks.</td>
<td>Pre-treatment, Post-treatment and 1 month follow-up 1. McGill Pain Questionnaire 2. Activity Log of time spent in sitting, standing/walking and reclining.</td>
<td>very weak design, unclear reporting of drop-outs and final number of subjects in each condition.</td>
</tr>
<tr>
<td>Nicholas 1992</td>
<td>Randomized controlled trial.</td>
<td>n=20 adults</td>
<td>Attention-control condition was</td>
<td>Pre-treatment, Post-treatment and</td>
<td>18/20 subjects at post-treatment (1</td>
</tr>
</tbody>
</table>
### Characteristics of Included Studies (continued)

**The effectiveness of cognitive-behavioural interventions with people with chronic pain. A critical review of the literature by the Occupational Therapy Evidence-based Practice Research Group, McMaster University, Hamilton, Ontario.**

<table>
<thead>
<tr>
<th>Study</th>
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</thead>
<tbody>
<tr>
<td>Philips 1987</td>
<td>Randomized controlled trial comparing cognitive-behavioural and relaxation treatment</td>
<td>n=40 subjects at start of study age range 18 - 61 years male/female ratio not reported multiple pain sites, including back, head, facial. pain duration of more than 6 months.</td>
<td>1. Cognitive-behavioural group treatment, (n=25), outpatient basis, 1.5 hours per week for 9 weeks. Included relaxation, graded fitness, pain control, anxiety management and activity pacing. 2. Control condition (n=15) - wait listed between 2-6 months.</td>
<td>Pre- treatment, post-treatment, 8 weeks and 1 year follow-up. 1. Pain behaviour checklist 2. Pain intensity diary 3. Life Impact checklist 4. Beck Depression Inventory 5. McGill Pain Questionnaire</td>
<td>Number of drop-outs indicated in data tables: treatment group dropped from 25 to 22 at post-treatment and 19 at follow-up.</td>
</tr>
<tr>
<td>Turner 1993</td>
<td>Randomized controlled trial comparing cognitive-behavioural and relaxation treatment</td>
<td>N=102; outpatients with chronic back pain 47/102 male Mean age - 42 years</td>
<td>Cognitive-behavioural treatment outpatient group for 6 weeks, including adaptive thinking to decrease negative cognitions compared to standard relaxation treatment</td>
<td>Pre, post &amp; 6 and 12 month followup 1. pain intensity 2. activity level 3. control 4. depression</td>
<td>This study is a 3 group comparison of cognitive, relaxation and cognitive-behavioural plus relaxation. This review compares the cognitive-behavioural plus relaxation and relaxation treatment groups.</td>
</tr>
<tr>
<td>Turner 1982</td>
<td>Randomized controlled trial comparing cognitive-behavioural and relaxation treatment</td>
<td>n=36 participants with chronic back pain avg. 8.7 years pain duration 3 male, 33 female avg. age 42 years, range 20-63 years</td>
<td>1. cognitive-behavioural group treatment, including relaxation plus cognitive-behavioural goal setting, imagery and coping strategies 2. progressive muscle relaxation only</td>
<td>Pre-, Post-treatment, and 1-month follow-up. 1. Visual analog scale of pain severity 2. Sickness Impact Profile - self and other</td>
<td>2 drop-outs reported for comparison of 3 conditions: 14 in cognitive-behavioural group, 13 in relaxation group, 9 in control group. when 2 treatments compared pre</td>
</tr>
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</table>
### Characteristics of Included Studies (continued)

**The effectiveness of cognitive-behavioural interventions with people with chronic pain. A critical review of the literature by the Occupational Therapy Evidence-based Practice Research Group, McMaster University, Hamilton, Ontario.**

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</tr>
</thead>
</table>
| Turner 1988 | randomized controlled trial allocation concealment unclear | n=81 subjects with chronic low back pain average 6.2 years duration of pain 51 male, 30 female, mean age 46 years | 2 treatments and 1 control (wait list) group  
1. cognitive-behavioural treatment included relaxation, imagery, adaptive thinking and home practice  
2. operant behavioural treatment included social reinforcement, behavioural goals and spousal education  
Both treatment groups held 2 hours per week for 8 weeks. | Pre-treatment, post-treatment, 6 and 12 month follow-up assessments.  
1. McGill Pain Questionnaire Pain Rating checklist  
2. Pain behaviour checklist  
3. Videotapes of pain behaviour  
4. Sickness Impact Profile - self and other  
5. Cognitive Errors Questionnaire | Drop-outs reported for post-treatment assessment: 2 in cognitive-behavioural group, 1 in operant behavioural group and 4 in wait list group - not included in analyses. |

3. wait list control group treatments in group format, for 5 weeks, 90 minutes per week outpatient basis  
3. Diary of hours worked  
4. Beck Depression Inv. | and post: 18 in cognitive-behavioural group, 16 in relaxation group. |
Review: Cognitive-behavioural approaches and chronic pain

Comparison or Outcome

WMD (95%CI)

**cognitive-behavioural intervention versus standard/alternative care - short term**
- activity level (negative measures)
- physical skills (positive measures)
- depression (negative measures)
- coping (positive measures)
- cognition (negative measures)
- pain perception (negative measures)
- pain intensity (negative measures)
- family impact (negative measures)

**Cognitive-behavioural intervention vs. control (waitlist or no attention) - short-term**
- activity level (negative measures)
- depression (negative measures)
- cognition (negative measures)
- pain perception (negative measures)
- pain intensity (negative measures)
- family impact (negative measures)

**Cognitive-behavioural intervention versus standard/alternative care - long-term**
- activity level (negative measures)
- physical skills (positive measures)
- depression (negative measures)
- coping (positive measures)
- Cognition (negative measures)
- pain perception (negative measures)
- pain intensity (negative measures)
- family impact (negative measures)
Cognitive-behavioural approaches for people with chronic pain

Analysis and Interpretation of Table of Comparisons:

This table indicates the summary statistic for the 10 studies that were systematically reviewed using RevMan software. The summary statistic for each of the outcomes listed is the “weighted mean difference (WMD)”, as all of the data was continuous. The WMD is a statistical calculation of the scores for all of the studies that measured the outcome listed. The confidence interval is set at 95%. The scale for the weighted mean difference statistic is from -10 to +10.

In this table, the vertical line indicates “no difference” between the treatment and control groups. The summary statistic (i.e., the squares and lines) to the left of the vertical line indicates that the overall effect score for the outcome favours the control condition. The summary statistic to the right of the vertical line indicates that the overall effect score for that outcome favours the treatment condition (that is, Cognitive-behavioural intervention).

The outcomes that are compared in this table are listed on the far left side of the page. They are organized into 3 main comparison groups:
2. Cognitive-behavioural intervention versus control condition (waitlist or no attention) - short term outcomes;
3. Cognitive-behavioural intervention versus standard/alternative care - long term outcomes; and

Please note that there are no comparisons for cognitive-behavioural intervention versus control condition over the long term, as there was insufficient data.

Under each of these comparisons, there are 6-8 different outcomes that were measured in the 10 studies. These outcomes were measured in two or more studies to be included in this analysis. The terms “negative measures” means that the lower the score the better the outcome, whereas “positive measures” means that the higher the score the better the outcome.

Interpretation:

The summary statistic (WMD), which is the overall effect size, is graphically displayed as lines and squares in Table 3. The squares represent the mean and the lines indicate the confidence interval for the summary statistic. The results would not be considered as strong if the lines and/or squares were touching the vertical (no difference) line. The majority of the summary statistics in Table 3 are touching the vertical “no difference” line, which indicates a weak overall effect for most of the outcomes. The outcomes that are clearly in one direction are pain perception and pain intensity, which both favour the treatment condition (cognitive-behavioural intervention) over a control (wait-list or no attention) condition in the short term.

An arrow to the far right or left of the scale indicates that the summary statistic (WMD) is off the scale. This means that the outcome scores, when calculated together as a summary statistic, strongly favour one condition. This only occurred with one outcome: “Coping” under the comparison of cognitive-behavioural intervention versus standard/alternative care: for this outcome, the standard/alternative care condition was favoured.
Validated quality scale

1. Was the study described as randomized?
2. Was the study described as double-blind?
3. Was there a description of withdrawals and drop outs?

Give a score of 1 point for each 'yes' or 0 points for each 'no'

- Give 1 additional point each
- Deduct 1 point each

If randomization/blinding appropriate
If randomization/blinding inappropriate

Scoring range: 0 - 5
Poor quality <3