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Lance McCracken & Miles Thompson

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Psychological Advances in Chronic Pain: A Concise Selective Review of
Research from 2010

Lance M. McCracken*, Ph.D. & Miles Thompson, DClinPsy.

Bath Centre for Pain Services

Royal National Hospital for Rheumatic Diseases

Bath, UK

*Correspondence to:

Lance M. McCracken

Centre for Pain Services, Royal National Hospital for Rheumatic Diseases

Upper Borough Walls

Bath, BA1 1RL. UK

Abstract

Purpose of Review: It is difficult to hold an organized view of psychological research related to chronic pain. There are many different theories and variables and the volume of literature is vast. The purpose of this review is to highlight some key trends in this research in 2010.

Recent Findings: We conducted a search of the output of four prominent scientific journals in the field of chronic pain management. Five research topics from among those identified are summarized. Identified topics include psychological factors related to analgesic use, efficacy of cognitive behavioral treatments, and contextual approaches (including acceptance and mindfulness).

Summary: The largest number of psychological studies categorized for this review focused on psychological factors in relation to opioid use. These include studies identifying risk factors for aberrant drug behavior. This result seems to reflect that the dominant approach to chronic pain remains a pharmacological one. On the other hand treatment from within a broadly cognitive behavioral approach seems to have reached a level of relative maturity with questions frequently being addressed with meta-analysis. Otherwise, there are developing and promising trends, such as in new treatment models and uses of information technology.

Keywords: Chronic Pain, Recent Developments, Analgesic Use, Cognitive Behavioral Approaches.

Introduction

Chronic pain is a frequent and difficult to manage problem that is recognized as inherently psychological in nature. The volume of psychological research in this area appears to have increased and this increase is probably accelerating over time. Trends in psychological research can be extremely difficult to track as the quantity of studies now published each year is practically beyond the reading speed of the average researcher or clinician. And yet, keeping abreast of these trends can be important to promote progress within and between the disciplines, and to support best clinical practice. The purpose of the present review is to provide a concise summary of developments in psychological research in relation to chronic pain during 2010.

Method

As a basis for the current review we chose a literature search strategy targeting four of the major scientific journals that publish pain research for a multidisciplinary audience, including *Clinical Journal of Pain*, *European Journal of Pain*, *The Journal of Pain*, and *Pain*. In November and December 2010 we searched the electronic databases of each of these four journals examining all published output, excluding “in press” articles, for the year. We visually inspected the table of contents of each issue reviewing article abstracts and method sections as necessary. We selected studies of chronic pain that included a psychological variable as a primary focus. Articles were excluded if they primarily focused on animals, children or adolescents, acute or sub-acute pain, or primarily physiological processes with little relevance to psychological variables.

The search process initially led to a pool of 25 studies from the *Clinical Journal of Pain*, 38 from the *European Journal of Pain*, 30 from *The Journal of Pain*, and 36 from the journal *Pain*, for a total pool of 129 articles. Paper copies of the remaining articles were sorted into psychological themes through a process of discussion and agreement. Titles and abstracts were screened again against the exclusion criteria above. This

reduced the total number of articles from 129 to 97. Table 1 lists the primary topics and the numbers of articles identified within each.

As shown in Table 1 the most frequent topic of study was psychological factors related to analgesic use, mostly opioid use. The second most frequent topic included studies of the efficacy or effectiveness of broadly Cognitive Behavior Therapy approaches. Following those were studies of three different topics, catastrophizing, contextual approaches, and emotional factors, each with an equal number of studies identified. The studies of contextual approaches included studies of acceptance, mindfulness, and psychological flexibility. The studies of emotional factors mainly included studies of anxiety and depression.

Due to the limited scope of the present review, we summarize five categories, including those that appeared most important, interesting, and potentially progressive.

Psychological Factors in Relation to Analgesic Use: Particularly Opioids

A primary finding of the current review is that the most frequent topic of psychological research from the four journals was psychological factors in relation to analgesic use. In this area studies designed to identify risk factors for addiction, dependence, or other aberrant drug related behavior were most common. These studies mostly included large samples of patients seeking treatment and showed that misuse of opioids in chronic pain is associated with younger age [1*, 2*], depression [1*, 3*], lower physical disability [3*], more alcohol, tobacco or other substance use [1*, 2*] and the use of short acting opioids [2*]. A study focusing on both sedative or opioid abuse or dependence found that those classed as having a prescription drug use disorder were more likely to be male and white, to have a family history of substance abuse, to have greater functional limitations, to smoke, and to meet criteria for PTSD [4].

Another series of studies examined factors that predict the degree of opioid use in patients with chronic pain. These studies consistently showed that those with chronic

pain on long term opioids and those on higher doses consistently demonstrate higher psychopathology [5] and are more likely to have mental health or substance use disorders [6, 7].

A randomized trial by Jamison and colleagues addressed compliance with opioid use in patients identified as at high risk of misuse [8]. In this trial 21 patients were assigned to “compliance treatment” consisting of monthly urine screens, compliance checklists, and both individual and group motivational counseling. This group was compared to a control group of 21 patients given monthly electronic diaries to complete and no other treatment. Another control group of 20 low risk patients had no additional treatment. At a six-month follow-up the groups showed significant differences in drug misuse, with 73.7% in the high risk control group demonstrating misuse compared to 26.3% of those in the high risk group who attended the compliance treatment and 25.0% in the low risk controls.

Efficacy of Broadly Cognitive Behavioral Therapies for Chronic Pain

Cognitive Behavioral Therapies (CBT) appear to be the dominant psychological approach to chronic pain and the primary model followed in most comprehensive pain centers. Two systematic reviews and meta-analyses have been published recently. Glombiewski and colleagues investigated psychological treatments for fibromyalgia [9]. They identified 23 studies and found small but robust effect sizes for long term efficacy in relation to pain, sleep, depression, catastrophizing, and functional status. Wetering and colleagues studied the effect of CBT interventions on adults with chronic neuropathic pain [10]. They included 14 studies and concluded that because of the poor methodological quality of the studies they were unable to provide an overall comment on the effectiveness of psychological therapies. Eccleston and colleagues published a commentary on this review [11*]. Among other factors, they noted that many studies included in recent systematic reviews related to chronic pain show potential allocation

bias, have unclear randomization or blinding, lack comparison arms, have low subject numbers, and may use imprecise definitions of relevant pain conditions or treatments of interest.

Some of the confusion that can arise in the development and use of evidence was shown in a survey of evidence-based practice guidelines for the management of fibromyalgia produced by the American Pain Society (APS), the Association of the Scientific Medical Societies in Germany (AWMF) and the European League Against Rheumatism (EULAR). Researchers found marked differences for “first line” therapies recommended by the APS and AWMF on the one hand and the EULAR on the other [12]. The APS and AWMF recommended exercise, CBT, amitriptyline and multi component treatment while EULAR recommended pharmacological treatments only. It appears that these differences emerge primarily from the fact that the APS and AWMF regarded systematic reviews and meta-analyses as the highest form of evidence and EULAR did not.

Other treatment effectiveness research published in the year included an RCT comparing group based psychological intervention and individualized physiotherapy input for adults with neck pain. This research found better results for the group based treatment at 20 weeks in terms of pain control, self-efficacy, disability and catastrophizing [13]. Other research examined moderators of treatment effect including pain extent [14], psychological classification [15]; predictors of improvements in fibromyalgia [16], and of predictors of treatment dropout [17].

Contextual Cognitive Behavioral Approaches to Chronic Pain

Generally what are called “contextual” approaches to chronic pain include processes such as acceptance and mindfulness. These approaches tend to focus on creating change in the individual’s relationship to their pain and other psychological experiences rather than changes in the content of the pain experiences themselves.

Specific therapy approaches that reflect this area of work include forms of Mindfulness-Based Stress Reduction (MBSR [18]) and Acceptance and Commitment Therapy (ACT [19]).

Assessment instrument development is a continual focus in psychological research. A systematic review examined measures of acceptance of chronic pain [20]. Acceptance of pain is defined as a quality of engagement with activities in the presence of pain, without defense or attempts to avoid or control the pain, as a means to pursue ones goals and values. The review included 23 studies of 4 measures and although it was found that none presently met all criteria for psychometric quality, one measure, the Chronic Pain Acceptance Questionnaire, (CPAQ [21]) has the strongest qualities. This questionnaire has been further validated for internet delivery and a short version has been developed [22].

There are numerous psychological processes that are part of contextual approaches. Central to ACT is the process called "psychological flexibility." Wicksell and colleagues have developed a measure of the opposite process called the Psychological Inflexibility in Pain Scale (PIPS [23]). So far this measure has been demonstrated to account for more variance than a measure of fear and avoidance in relation to pain, disability, life satisfaction, and depression, in a sample of people suffering chronic pain due to whiplash. This measure was subsequently also used in a study showing that psychological inflexibility mediated improvement in disability and life satisfaction observed during treatment with ACT for this same patient group [24].

The year also produced the first studies of general psychological acceptance in relation to chronic pain. This involves a more general capacity to accept varied psychological experiences, such as distressing thoughts and feelings, separate from acceptance associated with pain experiences more specifically. This process has now been demonstrated to be significantly related to lower disability and distress and better

overall functioning in patients from specialty [25*] and primary care [26]. It is notable that general psychological acceptance demonstrates significant relations with patient outcome even after acceptance of pain is taken into account.

Along with the growing literature on the efficacy and effectiveness of ACT-based treatment for chronic pain, it has now been demonstrated that this approach produces benefits even when administered as a self-help book [27].

Social, professional and other contextual influences

Professionals are increasingly aware of how social contexts, including responses from others, can create patterns of influence on the behavior of the pain sufferer and themselves. For example, Williams and colleagues examined a database of 3,050 individuals who completed a program of interdisciplinary treatment for the influence of treatment group membership and staff turnover on individual outcomes [28*]. Illustrating the effects of group membership using intraclass correlations they found differences in self efficacy, catastrophizing, and distance walked at both the end of treatment and at one month follow-up dependent on the treatment group to which the individual belonged. Linear regression also suggested that periods of high staff turnover resulted in poorer patient post treatment outcomes in terms of self efficacy and distance walked.

Social circumstances can also influence professional behavior. Gulbrandsen and colleagues videotaped consultations where 29 doctors, physiotherapists, and chiropractors, provided 79 patients with the results of MRI scans [29*]. The quality of health care professional communication negatively correlated with patient variables such as duration of back pain and patient age. The longer patient pain was present and the older the patient was the poorer health care professionals communication tended to be.

In a study of ways to positively influence professional behavior Elhwairis investigated an education program provided to 28 internal medicine residents about treatment of chronic pain [30]. Their results showed improvements in both knowledge

and confidence levels in the residents. Whether such shifts in knowledge or confidence produce shifts in practice, however, is an open question. Social influence exists in other arenas as well, such as within intimate relations and this is another interesting area of developing research [31, 32].

Telehealth

Applications of communication, computer, monitoring, and other information technologies are rapidly developing in pain management. In their topical review of the area, Keogh and colleagues highlight how “telehealth” methods are currently supporting education, assessment, and treatment for chronic conditions [33*]. Examples of these technologies include the internet, telephone devices, including text messaging, as well as other hand held monitoring and sensing devices.

In a systematic review of controlled trials of internet-based CBT, Macea and colleagues identified eleven studies that compared internet based interventions and waiting list groups [34]. Overall, results showed a large drop out rate (26.6%) and a small pooled effect size. It is important to note, however, the authors used pain reduction as their primary outcome measure, and this is not always the primary focus of CBT-based treatments. More recently, Williams and colleagues conducted a RCT investigating the usefulness of a web-enhanced behavioral self-management program for 118 individuals with fibromyalgia [35]. Here the telehealth intervention condition demonstrated improved physical functioning and improved well-being as well as reductions in reported pain at six months in relation to standard care.

Naylor and colleagues conducted an RCT investigating the use of an automated telephone based system designed to maintain and enhance reductions in analgesic use following a course of CBT [36]. The telehealth system allowed individuals to interact with a computer via a touch-tone keypad, to enter questionnaire responses, and to access both recorded reviews of treatment material and recorded personalized feedback. At

post treatment those in the automated telephone condition had reduced opioid use. At a 4-month follow up 21% had discontinued all opioid use and 23% had discontinued NSAID use. Those in standard care showed increases in the use of both. Finally, in a relatively novel application of technology a “web-based” course was studied as a means for training internal medicine residents about opioid therapy for chronic pain and was demonstrated as effective [37].

Conclusion

The purpose of this review was to identify trends in psychological research in relation to chronic pain by examining the content of four prominent journals during 2010. The result was a classification of eight areas of study, including psychological factors related to analgesic use, efficacy of CBT, catastrophizing, contextual approaches, emotional influences, fear of pain and avoidance, and telehealth.

The largest numbers of psychological studies in one area focused on analgesic use, including identification of risk factors for misuse, predictors of long term use, and treatment to reduce risk of misuse. At first this result was surprising. On the other hand perhaps it is to be expected as clearly around the globe the overwhelming focus of treatment of chronic pain is pharmacological.

In addition to ongoing studies of treatment efficacy for broadly CBT-based approaches, we identified a number of other notable trends in the literature, particularly studies of contextual approaches, social influences, and telehealth. These research directions appear progressive as they are already leading to new treatment and training methods. However, only time will tell if these lead to lasting developments.

Any review using the methods we have will have limitations. Choices were made about our selection criteria, the journals to include, and the way studies were classified. This inevitably will include biases and different methods for conducting the same review

may have found different results. Nonetheless this process did allow us to bring organization to and provide a perspective on this large and growing literature.

Key Points

The most frequent topic of psychological research found in this review concerned psychological factors in relation to analgesic use.

Evidence for the efficacy of CBT continues to be demonstrated through meta-analysis but caution is advised when both applying and interpreting this research.

Research in and evidence for contextual approaches such as ACT continues to grow.

Studies continue to demonstrate the power of contextual factors on both patient and professional outcomes.

The field of telehealth is increasingly delivering education, assessment and treatment using information technology.

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Table 1.

Area of psychological research from four prominent pain journals and number of articles published during the 2010 review period.

Psychological Research Area	Number of Published Articles
Psychological Processes in Analgesic Use	14
Cognitive Behavioral Treatment Efficacy	12
Catastrophizing	10
Contextual Cognitive Behavioral Approaches	10
Emotional Factors: Anxiety and Depression	10
Social Influence and Healthcare Interactions	9
Fear of Pain and Avoidance	6
Tele-Health or e-Health Applications	4
Assorted Studies of Psychological Processes	22
Not Otherwise Classified *	
TOTAL STUDIES	97

Note: The total number of studies here excludes 32 that were, based on further review, deemed irrelevant to the review as they included healthy subjects, transient pain experiences, focused primarily on acute or subacute pain, or did not include a primary focus on a psychological variable(s).

* These studies included such topics as attention, obesity, coping, beliefs, sex-differences, and sleep.