

# Psychological Interventions for the Management of Chronic Pain: a Review of Current Evidence

Ronald S. Kaiser<sup>1</sup> · Mira Mooreville<sup>2</sup> · Kamini Kannan<sup>3</sup>

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**Abstract** Chronic pain is a complex disorder to which medical and psychological factors both contribute and react. While there are numerous chronic pain conditions, they share certain experiences. This review examines some of the psychological factors that are common to the pain experience and some of the psychologically-based treatments that have been utilized in conjunction with medical treatments for pain. In light of the fact that there is not yet a “gold standard” in this regard, it ends with the challenge to develop coherent and effective multi-model treatments that draw upon the successes that have been demonstrated so far.

**Keywords** Acceptance and Commitment Therapy (ACT) · Anxiety · Biofeedback · Catastrophizing · Chronic pain · Cognitive-Behavioral Therapy (CBT) · Depression

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✉ Ronald S. Kaiser  
Ronald.kaiser@jefferson.edu

Mira Mooreville  
miramooreville@gmail.com

Kamini Kannan  
kaminika@pcom.edu

<sup>1</sup> Jefferson Headache Center, Jefferson Hospital for Neuroscience, 900 Walnut Street; Suite 200, Philadelphia, PA 19107, USA

<sup>2</sup> Jefferson Headache Center, Institute for Graduate Clinical Psychology, Widener University, One University Place, Chester, PA 19013, USA

<sup>3</sup> Jefferson Headache Center, Department of Psychology, Philadelphia College of Osteopathic Medicine, 4170 City Avenue, Philadelphia, PA 19131, USA

## Introduction

In the twenty-first century, there has been an increasing recognition of the interaction between psychological factors and pain. Chronic pain and psychological disorders are the two most common ailments diagnosed in the USA, and approximately one half to two thirds of chronic pain patients display symptoms of psychological distress [1]. Depression is the most commonly diagnosed psychiatric condition among pain patients, but anxiety disorder, somatization, and drug dependency are also quite common [1]. On a more complex level, many pain patients have had experiences with abuse, PTSD, and litigation that may be contributory to psychological distress.

The relationship between psychological factors and pain is complex and multifaceted. Prolonged pain is an obviously stressful experience. There have been over 300 studies on stress and immunity demonstrating that prolonged stress can negatively modify features of the immune response [2]. Understanding of the contributions of the central nervous system to both pain and depression is recognized but is still in its infancy [3]. While there is the indication that depression is a biochemical risk factor for the development of chronic pain, it is easily recognized that being in chronic pain is depressing and can also create anxiety about when the next exacerbation will occur and how limiting it will be. Pain and mood can share biochemistry and each can influence and be reactive to the other. Large population-based studies have demonstrated strong relationships between depression, anxiety, and pain disorders [4, 5].

This review is designed to examine the psychological experience of being in chronic pain, as well as highlighting recent treatment approaches that have been successful in addressing and modifying psychological reactions. It is being written with the recognition that both physical and emotional

factors need to be considered and addressed when dealing with the complex problem of chronic pain. Articles were found in the PubMed, Google Scholar, ResearchGate, and Academia.edu databases as well as random searches of psychological and medical literature. Inclusion criteria for this review were randomized controlled experiments and review articles that included psychological factors associated with chronic pain. Literature under review has been selected with an emphasis on recency and with a preference for articles that permit generalizing to multiple types of pain rather than one specific area of the body.

## The Psychological Experience of Pain

Chronic pain is an individual experience that affects the entire person—body, mind, and spirit [6•]. Research suggests that psychosocial factors can often predict levels of pain, functioning, and adjustment. In one study, perceived social support and self-efficacy beliefs were significantly associated with pain interference [7]. However, there was an unclear pattern of “adaptive” coping skills that could be significantly associated with lower levels of pain interference and higher levels of physical and psychological functioning. Coping responses such as catastrophizing, praying, hoping, guarding, resting, asking for assistance, and relaxation were both positively and negatively associated with pain interference in this study. Task persistence, on the other hand, was one coping response that consistently showed weak but positive associations with physical and psychological functioning.

There are, on the other hand, multiple studies demonstrating the negative impact of catastrophizing thoughts—i.e., fearing the worst, assuming that nothing will improve the pain beyond its present level [6•, 8, 9•]. The tendency for patients to internalize pain-related stigma was associated with a greater tendency to catastrophize about pain and a reduced sense of personal control over pain [8]. Stigma is not a construct often reported in pain literature, which suggests the need for greater consideration of the sociocultural context, because internalized stigma is strongly associated with indicators of patient outcome [8].

Pain has been found to have a negative effect on cognitive performance and attentional processes and may affect brain regions involved in cognition. Subtle forms of altered perception are seen in many chronic pain syndromes, such as phantom limb pain [9•]. A model of pain neuroscience psychology was explored by Simons et al., based on the interaction of pain and psychological factors in two ways: the experience of pain triggering a cascade of neurological (initially sensory) events that lead to an altered psychological state; and the presence of prior psychological states providing a heightened risk for pain chronicity due to processes such as cross sensitization, where exposure to stress in the past—such as childhood trauma, loss

of a parent, and addiction—results in greater sensitivity to other seemingly unrelated stimuli [9•].

Research suggests that both pain and emotions are associated with prognosis [6•]. Pain occurs in a social context, with interpersonal features being extremely important to experience [8]. Negative affective states contribute to worsening pain conditions leading to declining psychological outcomes [9•]. The model of pain neuroscience psychology asserts that social pain (feeling socially disconnected) may have the same neurobiological underpinnings of physical pain, which suggests that the pain patient should be assessed in a holistic manner [9•].

## Individual Factors

Because individual factors have such an impact on the expression of chronic pain, treatment effectiveness may not only vary by chronic pain condition but also within each condition [6•]. Pain research points to several psychological and psychosocial factors that can impact an individual’s perception and presentation of pain—including symptom appraisals, ability to manage pain, fears about pain or causing further injury/re-injury, coping mechanisms, heightened emotional reactivity, maladaptive attitudes and beliefs, self-efficacy, social beliefs, and cognitive ability to process emotional responses [6•].

Premorbid vulnerability factors likely contribute to whether or not an individual develops chronic pain. Key risk factors include prior physical and psychological trauma, social dysfunction, catastrophizing, social status, and gender. Of all types of childhood abuse, sexual abuse appears to determine the greatest predisposition to chronic pain [10].

Lower socioeconomic status is correlated with obesity, lower level of education, and health-care inequalities. It is also possible that dopamine deficits in individuals with low social standing predisposes them to chronic pain [9•]. While acute pain activates mesolimbic reward-related pathways and brings about sudden alterations in psychological states (e.g., fear, stress, and avoidance), chronic pain is associated with progressive changes and an uncompromising decline in psychological health. Accompanying this decline is reward deficiency (i.e., diminished dopaminergic effects), pain sensitization, and cross sensitization (e.g., vulnerability to depression, anxiety, addiction, etc.) along with increased associated level of chronic stress [9•].

## Stigma and Social Support

Stigma, conceptualized as a characteristic that conveys a devalued identity within a particular social context, is clearly important in framing meaning and suffering [8]. Internalizing

feelings of stigma may help patients justify their high levels of anxiety, obsessive thoughts, and preoccupation about physical functioning [11]. A sizable percentage of people with chronic pain (38 %) endorsed the experience of internalized stigma [8]. Even after controlling for depression, internalized stigma still had a negative relationship with self-esteem and pain self-efficacy [8].

In the rehabilitation process, Waugh et al. recommend exploring whether addressing internalized stigma elicits improvements in psychological well-being and behavioral outcomes. They also recommend exploring whether factors that contribute to positive processes, such as empowerment in the face of stigma, would help to inform the use of training to facilitate resiliency [8]. Research in this direction is being pursued at Jefferson Headache Center (JHC) in Philadelphia.

Recent research at the JHC has established a relationship between some personality factors and stigma among patients with migraine headaches who were administered either the Minnesota Multiphasic Personality Inventory (MMPI)-2 or the MMPI-2-RF [11]. The results demonstrate that personalized psychological interventions are likely to be effective due to targeting specific personality traits. At the episodic migraine stage, interventions should address stigma and related personality characteristics, such as a reported dislike of interacting with other people, in order to curtail the potential for chronification. Patients already experiencing chronic migraines can benefit from interventions aimed at educating the patient about stigma and personality characteristics [11].

Stigma can influence help-seeking behaviors and the likelihood of reaching out for support. Failure to address stigma in any type of intervention might contribute to chronification of pain due to internalizing. On an individual level, strategies such as personal empowerment and cognitive restructuring may be proven beneficial [8]. It is therefore important that both episodic and chronic patients work to develop skills to manage feelings of psychological stress so they can begin to decrease their anxieties, obsessions, and preoccupations to enable them to focus on moving forward [11].

### Active Self-Care

Complementary and integrative medicine (CIM) therapies acknowledge the patients' roles in their own healing processes and have the potential to provide more efficient and comprehensive chronic pain management [6••]. At this point, there are a number of promising treatments that have emphasized getting pain patients to see themselves as active participants in their care and improvement rather than seeing their pain as the central part of their self-definitions and passively assuming that there is nothing that can be done to change their circumstances.

## Approaches to Treatment

Research support for psychological approaches to chronic pain management in adults has significantly increased over the last several decades and falls under five major categories: cognitive and behavioral therapies, biofeedback, mindfulness, exercise, and multidisciplinary treatments. The current section will focus primarily on recent protocol interventions.

### Cognitive and Behavioral Treatments

Cognitive and behavioral treatments have yielded abundant empirical evidence for managing chronic pain conditions. These treatments are based on the idea that maladaptive cognitive and behavioral responses to pain should be replaced with healthier coping skills through use of cognitive restructuring, behavioral activation, setting behavioral goals, and relaxation. A few of the many variants of this approach will be highlighted.

Currently, cognitive behavioral therapy (CBT) is a first-line psychological treatment for individuals with chronic pain, such as back pain, headache, arthritis, and fibromyalgia [12•]. Since there is no single CBT protocol, CBT treatments in research differ in number of sessions and targeted techniques. Kerns et al. compared tailored CBT that uses motivational enhancement strategies with standard CBT that focuses on addressing and changing negative thoughts in adults with chronic back pain [13]. Although no treatment differences were found in terms of treatment engagement or adherence, participants who had high levels of adherence improved on outcome measures. A qualitative study investigated whether a CBT-based group could help six patients process the experience of loss associated with chronic pain [14]. The interviews with these patients indicated that addressing loss and cultivating acceptance may be crucial before any behavior changes are initiated. Nicholas et al. studied whether a behavioral exposure method that aims to reduce pain-avoidance behaviors would add benefit to standard CBT [15]. Although the results appeared to indicate that this add-on to CBT did not significantly differ from CBT alone, higher adherence in each group was once again associated with improvement on measures of pain, pain perception, disability, and depression.

A newer form of behavioral treatment called acceptance and commitment therapy (ACT) deviates from CBT in that it emphasizes acknowledging and accepting mental events, rather than changing them, *per se*. By learning to be present and aware of thoughts and emotions, individuals indirectly modify behavior that is consistent with their overall values and goals. Wetherell et al. compared an 8-week treatment of ACT to CBT in individuals with chronic, nonmalignant pain [16]. Participants in both conditions improved on measures of pain interference, depressive symptoms, and pain-related anxiety,

and improvements were maintained at the 6-month follow-up. These results are promising considering that participants had, on average, 15 years of pain. There were no significant differences in treatment outcomes between groups. In another study, researchers assigned patients with comorbid migraine and depression to either a 1-day ACT training plus migraine education workshop or to treatment as usual [17]. The results suggested that participants in the experimental condition demonstrated significant improvements in reducing headache frequency, headache severity, medication use, and headache-related disability, while the control group did not demonstrate improvements in these outcomes. Overall, it appears that both CBT and ACT are efficacious treatments for chronic pain management, which can enhance the effects of medication.

Mindfulness-based cognitive therapy (MBCT) is another cognitive treatment that integrates elements of CBT and mindfulness practice. Day, Thorn, and Rubin conducted a pilot study in which they investigated patient characteristics associated with response to treatment during an 8-week MBCT protocol for headache management [18]. Improvement in psychosocial outcomes was noted, with change in pain-related cognitions as a prominent factor within treatment responders. This provides further evidence for adopting a cognitive approach to treating pain conditions.

Behavioral treatments have also been delivered through telemedicine. Specifically, one study examined the effects of a web-based chronic pain management program that drew from CBT theory to target coping, medication adherence, social support, comorbidities, and productivity in participants with a variety of chronic pain conditions [19]. The authors concluded that the participants exhibited improvement in pain intensity, pleasantness, and pain interference at 1 and 6 months posttreatment. Another online behavioral training program for migraine self-management found improvements in participants on measures of attack frequency, self-efficacy, internal and external control, triptan use, and migraine-specific quality of life [20]. Further research is needed to explore online delivery of psychological interventions for chronic pain.

## Biofeedback Treatments

Biofeedback techniques involve the use of electrical sensors to monitor various physiologic processes and bring them under voluntary control, generally through relaxation. Among the processes that are often monitored in this way are surface EMG, heart rate, breathing, temperature, and brain waves. Through the use of sensors that are connected with a computer, a patient can receive visual and/or auditory feedback regarding baseline functioning, as well as receiving feedback as improvement occurs to enable learning to take place so that seemingly involuntary processes come under the patient's control.

While biofeedback has been used under a variety of conditions from anxiety to incontinence to Raynaud's, some of its most successful interventions have been in the pain area—including chronic musculoskeletal pain, arthritis, and especially headache, where thermal and EMG biofeedback is typically used as a complement to medication or an alternative when medication use is not advised (e.g., pregnant women, children and adolescents, patients who are prone to medication overuse) [21–26]. Holroyd and his colleagues have demonstrated that biofeedback can be as effective as some medications, and the combination of biofeedback and preventive medication can be more effective than either treatment alone [25, 26]. The combined medication/behavioral treatment is now a widely accepted standard in the headache field.

Among recent studies of biofeedback and pain, Berry et al. utilized heart rate variability training with veterans who were receiving treatment for chronic pain [27]. They found that after four biofeedback sessions, the treatment group members averaged statistically significant reductions in perceived pain, stress, negative emotions, and physical activity limitations. Just as biofeedback has effectively been utilized to enhance the effect of medication, Bruflat et al. provided a case report of a female office employee with a 8-year history of neck pain who experienced a reduction in neck disability, trait anxiety, and trapezius muscle tension following eight physical therapy sessions and eight stress management sessions that included EMG biofeedback [28]. Additionally, the patient reported a total absence of neck disability at her 2-year follow-up assessment.

## Mindfulness Treatments

The primary goal of mindfulness treatments is awareness of the somatic sensations within the body, without judgment or emotional charge. Through meditation, individuals can learn to acknowledge their pain in a nonjudgmental way, and this process may reduce associated distress. Davis et al. compared the effects of three groups of adults with rheumatoid arthritis: CBT, mindful awareness and acceptance treatment, and arthritis education [29]. The results showed that the mindful awareness and acceptance group yielded greater reductions than did the other conditions in daily pain-related catastrophizing, morning disability, fatigue, and daily stress-related anxious affect. The results of a qualitative study exploring the experience of pain among 16 patients attending a mindfulness program for persistent back pain indicated a greater acceptance of pain and better quality of life among participants [30]. Major themes of the program included unpacking the pain experience, changing the relationship to pain, letting go of the label, self-compassion and acceptance, and “wellness within illness.”



Mindful-based stress reduction (MBSR) is a standardized 8-week mind-body intervention that focuses on principles of mindfulness as well as yoga/meditation. In a randomized controlled clinical trial, patients with nonspecific chronic pain were assigned to either an MBSR program or to a wait list control [31]. Improvements in the experimental group were seen on measures of vitality, general anxiety and depression, psychological well-being, feeling in control of the pain, and higher pain acceptance immediately after the intervention and at the 6-month follow-up. Wells et al. also applied a MBSR program with migraine patients in a pilot study, compared to treatment as usual [32]. Although the sample size was small, the program was safe and feasible. Participants in the MBSR condition exhibited fewer migraines per month and decreased severity of migraines, although these effects were not statistically significant. Significant improvements were observed on measures of reduced disability, self-efficacy, and mindfulness in program participants. Finally, a mindfulness-based therapy (MBT) program that was based on MBSR but shorter in duration (6 weeks) appeared to be effective for reducing headache frequency in adults with chronic tension-type headache [33]. In general, programs that teach mindfulness appear to be promising for both physical and psychological symptoms of chronic pain.

While mindfulness treatments lack the concrete feedback provided by the instrumentation of biofeedback modalities, they do offer the hope of achieving significant improvements without the costs of biofeedback equipment.

## Exercise Treatments

An important component of treatment for chronic pain is physical activity, which has positive effects on mind and body. It has been suggested that even sound psychological treatments for chronic pain may not significantly increase physical activity, and specific targeted treatments for exercise are needed and may augment these psychological treatments [34]. Kisan et al. studied the effect of yoga practice 5 days a week for 6 weeks in addition to conventional care, compared with conventional care alone in migraine patients [35]. Yoga with conventional care demonstrated significantly more improvement than the control condition. Specifically, these participants had improved vagal tone, reduced sympathetic activity, and better cardiac autonomic balance. Patients with musculoskeletal pain were assigned to one of two rehabilitative interventions in a qualitative study, including a tailored physical activity program [36]. The results indicated that exercise provides an in-the-moment experience, which may allow patients to progress forward in coping with illness. In yet another study, older women with chronic pain participated in a 12-week intervention feasibility study that integrated behavioral medicine and physical therapy [37]. Results were encouraging

in that the program improved the level of physical activity and self-efficacy for exercise, but further research should test this intervention on a larger sample size and evaluate the effects on pain-related beliefs and disability.

## Multidisciplinary Treatments

Finally, multidisciplinary treatments have been studied with chronic pain patients. One program, mindfulness-oriented recovery enhancement (MORE) is a multimodal intervention that blends aspects of mindfulness, CBT, and positive psychology, targeting mechanisms that underlie chronic pain and opioid misuse [38]. Compared with a standard support group, MORE participants showed significantly greater reductions in pain severity, pain interference, stress arousal, and desire for opioids. Kowal et al. studied changes in suicidal ideation in individuals with chronic pain after participating in a 4-week interdisciplinary treatment that combined fitness, psychotherapy, occupational therapy, relaxation, lectures, and group discussions [39]. Posttreatment, there were significant reductions in suicidal ideation, pain intensity, depressive symptoms, global distress, and pain catastrophizing. However, patients with higher baseline suicidal ideation were still more likely to show similar self-harm levels after completing the program.

Examining follow-up outcomes, Tavafian et al. followed participants with low back pain for 30 months, who were either assigned to a multidisciplinary group-based rehabilitation program or oral drug treatment alone [40]. The intervention included group sessions led by a physiotherapist, rheumatologist, psychologist, and health education specialist. Thirty months after the intervention, improvements in mental health and disability were maintained by the program participants. Cognitive mechanisms were the focus in a multidisciplinary treatment of patients with chronic widespread pain [41]. The program included neurophysiology education, medication management, CBT, pain management skills, physical training, relaxation, and assertiveness training in both group and individual formats. The results showed that reductions in negative emotional cognitions were related with improvements in all outcome measures, such as pain interference and depression.

Thus, multidisciplinary treatments may hold promise for chronic pain management, particularly if replication studies are undertaken. Currently, the wide variability among the formats of these treatments makes it difficult for researchers to gather ample empirical evidence for a standardized protocol across populations and specific pain conditions.

## Conclusion

There is now ample evidence to indicate that treatment of chronic pain patients cannot effectively be done while ignoring psychological factors. The combination of pain and both

intrapersonal and interpersonal factors, contributory and reactively, makes the experience of pain a combined medical and psychological disorder. Depression, anxiety, distorted cognitions, and stigma are among the factors that add to the complexity of the problem.

**Table 1** Effectiveness of psychological interventions in chronic pain studies with more than 100+ participants

| Author<br>Chronic pain<br>condition/s                    | Interventions (no. of studies or interventions)   | Total no. of<br>participants | Length of<br>follow-up<br>(months)    | Results  |
|--|---|------------------------------|---------------------------------------|--|
| Davis et al.<br>Rheumatoid<br>arthritis                  | 1) CBT<br>2) Mindful awareness and acceptance treatment<br>3) Arthritis education   | 143<br>participants          | Posttreatment<br>only                 | The mindful group yielded greater reductions than other conditions in daily pain-related catastrophizing, morning disability, fatigue, and daily stress-related anxious affect   |
| De Rooik et al.<br>Chronic<br>widespread<br>pain         | Program targeted cognitive mechanisms by neurophysiology education, medication management, CBT, pain management skills, physical training, relaxation, and assertiveness training in both group and individual formats                            | 120<br>participants          | 6- and 18-<br>month<br>follow-up      | Reductions in negative emotional cognitions were related with improvements in all outcome measures, such as pain interference and depression   |
| Garland et al.<br>Chronic pain<br>patients               | 1) Mindfulness-oriented recovery enhancement (MORE) is a multimodal intervention that blends aspects of mindfulness, CBT, and positive psychology, targeting mechanisms that underlie chronic pain and opioid misuse<br>2) Standard support group | 115<br>participants          | 3-month<br>follow-up                  | Compared with a standard support group, MORE participants showed significantly greater reductions in pain severity, pain interference, stress arousal, and desire for opioids  |
| Kerns et al.<br>Chronic back<br>pain                     | 1) CBT with motivational enhancement strategies<br>2) CBT   | 128<br>participants          | 6 months <sup>a</sup>                 | No treatment difference found with engagement or adherence but increased adherence led to improved outcome measures  |
| Kowal et al.<br>Chronic pain<br>and suicidal<br>ideation | Four-week interdisciplinary treatment that combined fitness, psychotherapy, occupational therapy, relaxation, lectures, and group discussions   | 250<br>participants          | Posttreatment<br>only                 | Significant reductions in suicidal ideation, pain intensity, depressive symptoms, global distress, and pain catastrophizing. However, patients with higher baseline suicidal ideation were still more likely to show similar self-harm levels after completing the program |
| la Cour et al.<br>Chronic pain                           | 1) Mindfulness-based stress reduction (MBSR) is a standardized 8-week mind-body intervention<br>2) Wait list control  | 109<br>participants          | 6-month<br>follow-up                  | Improvements in vitality, general anxiety and depression, psychological well-being, feeling in control of the pain, and higher pain acceptance   |
| Nevedal et al.<br>Variety of pain<br>conditions          | Web-based chronic pain management program   | 645<br>participants          | 1- and 6-<br>month<br>follow-up       | Improvement in pain intensity, pleasantness, and pain interference   |
| Nicholas et al.<br>Chronic pain                          | 1) CBT with behavioral exposure method<br>2) CBT  | 140<br>participants          | 12-month<br>follow-up                 | No treatment difference found but increased adherence led to improvement on measures of pain, pain perception, disability, and depression  |
| Sorbi et al.<br>Migraine                                 | Online behavioral training program for migraine self-management   | 368<br>participants          | 6-month<br>follow-up                  | Improvements on measures of attack frequency, self-efficacy, internal and external control, triptan use, and migraine-specific quality of life   |
| Tavafian et al.<br>Low back pain                         | 1) Multidisciplinary group-based rehabilitation program (group sessions led by a physiotherapist, rheumatologist, psychologist, and health education specialist)<br>2) Oral drug treatment alone  | 197<br>participants          | 3, 6, 12, 18,<br>24, and<br>30 months | Significant improvements in mental health and disability were maintained by the program participants   |
| Wetherell et al.<br>Chronic,<br>nonmalignant<br>pain     | 8 weeks<br>1) ACT<br>2) CBT   | 114<br>participants          | 6-month<br>follow-up                  | No significant differences in treatment outcomes; both conditions improved on measures of pain interference, depressive symptoms, and pain-related anxiety   |

The wide variability among the formats of these treatments makes it difficult for researchers to gather ample empirical evidence for a standardized protocol across populations and specific pain conditions (e.g., low back and neck pain studies used several different definitions) [6••]. We have comprised a sampling of the studies in our article

<sup>a</sup> Results not reported in the study due to focus on treatment adherence and engagement

Fortunately, there are now a number of psychological approaches that have demonstrated success in modifying patients' emotional responses to their pain. Cognitive behavioral therapy has been a well-documented treatment approach that has improved outcomes by helping patients to change thinking processes away from catastrophizing and dwelling on the role of being a patient. Newer approaches such as ACT and MBSR offer additional hope for pain patients.

Biofeedback has a history of success with various pain conditions, with particularly good success when prescribed for headache patients. Newer mind-body approaches, including mindfulness and exercise, have been encouraging, and multidisciplinary approaches combining several treatment modalities are promising, although, so far, lacking standardization.

Positive psychology approaches have not yet been widely used with chronic pain populations, but this would be a reasonable area to pursue. We know that positive emotions are associated with health and success in the general population [42, 43]. Kaiser has developed a positive psychology-based approach, called goal-achieving psychotherapy, and has successfully used it—initially with headache patients—and now other types of pain patients [44]. The emphasis in these types of approaches is on building strength to make changes for the future rather than dwelling on negative experiences such as pain and the conditions that led to pain.

The results of studies involving psychological interventions with pain patients that recruited more than 100 participants are contained in Table 1. Another comprehensive table, covering a broad range of interventions with a large number of categories of pain patients, is contained in the article by Lee et al., and it is not reproduced here [6••].

At this point, there is no “gold standard” of treatment. Pain is a complex disorder, and it has increasingly been recognized that effective treatment of pain requires the combined efforts of various different specialties. Further exploration needs to take place to provide treatment in both individual and group settings. Pain specialists can no longer ignore the role that psychological factors play and mental health professionals need to be comfortable in accepting the role that medical disorders contribute to emotional discomfort. Hopefully, an outcome of this review will be the encouragement of more studies that will utilize a range of medical and psychological modalities in creative ways to maximize the potential for successful outcomes.

Patients will benefit!

#### Compliance with Ethics Guidelines

**Conflict of Interest** Ronald S. Kaiser, Mira Mooreville, and Kamini Kannan each declare no potential conflicts of interest.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

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