

PSYCHOLOGICAL INTERVENTIONS FOR CHRONIC PAIN

Stephen T. Wegener, PhD, ABPP * Jessica Wolfman, PhD * Jennifer A. Haythornthwaite, PhD

Cognitive, affective, and social factors have long been recognized as influencing the experience of pain. Beecher¹ observed that the personal meaning of pain was an important determinant of the pain complaints he observed in soldiers wounded in World War II. Later, the work of Melzack and Wall² on the “gate-control” theory of pain stimulated much interest in the multidimensional and subjective aspects of the pain experience. The pioneering work of Fordyce and colleagues³ detailed the role social and environmental factors play in the way an individual expresses pain behaviorally. These historical developments supported by research data influenced the definition of pain promulgated by the International Society for the Study of Pain, which includes both sensory and emotional factors in the experience of pain.⁴ The literature in the role of psychological factors in the experience of pain was summarized in Turk, Meichenbaum, and Genest’s seminal work that detailed the application of cognitive-behavioral interventions in the management of chronic pain.⁵

The wide acceptance of psychological interventions as a treatment modality is based on two complementary lines of research. First, early studies of laboratory pain demonstrated the role of psychological factors in determining the level of reported pain and pain thresholds. Second, the psychotherapy literature demonstrated the positive impact that psychological interventions can have on many areas of functioning and quality of life. The benefit of psychological treatments among individuals with chronic pain is particularly clear for anxiety and depression, which are two emotional states shown to influence the experience of pain.

This chapter provides an overview of psychological interventions utilized for chronic pain, focusing primarily on the interventions that have been empirically tested through the use of clinical trials. Targets for psychological treatment include (1) reducing pain and pain-related disability; (2) treating comorbid mood disturbances, particularly depression; (3) increasing perceptions of control and self-efficacy; (4) increasing health behaviors, such as appropriate medication use, exercise/activation, sleep habits; and (5) addressing pain-related psychosocial factors, such as the impact of pain on family functioning and work life. This chapter provides practitioners with an overview of the evidence-based psychological interventions for the management of chronic pain. Specialized training is necessary to developing competency in applying these strategies.

BEHAVIORAL INTERVENTIONS

Learning theory, incorporating the principles of operant conditioning (e.g., reinforcement and punishment), provides the theoretical basis for behavioral interventions in

persons with chronic pain.³ In the case of acute pain, environmental and interpersonal contingencies have limited time to shape the pain experience. However, in the case of chronic pain the prolonged nature of the experience provides substantial opportunities for pain behaviors to be reinforced and maintained. Many of the behavioral techniques used in pain management are adapted from the strategies used extensively in managing anxiety, depression, and health behaviors.

OPERANT INTERVENTIONS

In an operant model of pain, the primary focus of intervention is the behavior of the patient. These behaviors can include either verbal expressions of pain (e.g., complaints of pain or requests for medication), gross motor movements that are indicators of pain (e.g., grimacing or limping), or avoidance of potential pain-generating activities. These observable behaviors are subject to the principles of operant conditioning, which state that a given behavior is highly influenced by the consequences of that behavior. Reinforcing consequences increase the likelihood that a behavior will occur in the future and neutral or punishing consequences decrease the likelihood that a behavior will occur. For example, when a patient grimaces and a loved one responds by expressing concern, grimacing may occur more frequently in the future when that loved one is present. In this case, the social attention in the form of concern reinforces the grimace. Alternatively, pain can serve as punishment for engaging in an activity. If an individual experiences pain during or following standing or walking, this is likely to decrease the frequency of these activities.

The goal of operant interventions is to decrease learned pain behavior and replace these maladaptive responses that are associated with the sick role with more adaptive behaviors.³ Operant interventions ideally occur in an environment where there is the opportunity to control the social consequences of pain behaviors and shape new more adaptive behaviors. Historically, most operant pain programs are based on inpatient units where this level of control is possible; however, operant conditioning interventions can be incorporated into outpatient treatment as well. “As needed” pain medication prescriptions are changed to fixed time intervals in order to remove the contingent relationship between complaints of pain (i.e., the pain behavior) and pain relief (i.e., the reinforcer). Pain complaints are largely ignored and more adaptive behaviors, including attending physical therapy and increasing activity level, are socially rewarded (i.e., reinforced).

Pacing and behavioral activation are important components of operant behavioral pain management programs. When individuals push their activity level to the point of

pain exacerbation, they are more likely to decrease their activity over time. Operant programs designed to avoid this negative pattern have three components:

1. Establish a baseline. A specific target behavior is identified, such as sitting at a desk. A baseline is established by measuring for several days the amount of time the individual can sit at the desk before exacerbation of back pain—for instance, an average 30 min.
2. Time-contingent activity is begun. Rather than having the individual sit until the pain is intolerable and then stop, an initial goal is set at 70% to 80% of the baseline level, such as 20 to 24 min. The individual would start by sitting no more than 20 min, thus avoiding the punishment of pain exacerbation and obtaining the social reinforcement associated with success.
3. The level of the behavior is gradually increased, usually no more than 5% per week with patients instructed to use time, not pain, as an indicator for stopping the activity. Over a period of weeks, the individual would increase the comfortable duration of sitting to perhaps 60 min without shifting positions or standing up.

This process of gradually increasing the nature, frequency, or duration of a behavior is called “shaping.” The goal of such an intervention is to increase the adaptive behavior while managing the consequences, which include removing any punishment (e.g., pain) and introducing reinforcement (e.g., experience of success, social attention). The involvement of the significant other or family in treatment is desirable, so they can be taught the principles for shaping behavior. Further, inclusion of others (i.e., family, friends, caregivers) in treatment can facilitate generalization of treatment gains from the inpatient setting to the home environment.

RELAXATION INTERVENTIONS

An extensive literature documents the benefits of developing a relaxation response, particularly in the areas of anxiety and stress management. The goal for most relaxation techniques is nondirected relaxation accomplished through two common components: first, repetitive focus on a word, body sensation, or muscle activity; and second, a passive attitude toward thoughts unrelated to the attentional focus.^{5,6} Common methods used for teaching relaxation include systematically tensing and relaxing specific muscle groups (e.g., progressive muscle relaxation), focusing on breathing and enhancing diaphragmatic breathing, and using guided imagery. A psychophysiological model of pain, which has received some empirical support,⁷ suggests that stress or pain leads to subtle increases in muscle tension, which can exacerbate pain at the site of an injury. A primary goal of relaxation training is to break the cycle between pain and muscle tension. Expert panels⁶ and meta-analyses⁸ summarized empirical support for the use of these techniques in pain management and recommended the broad integration of relaxation techniques with biomedical interventions for pain management.

BIOFEEDBACK

Biofeedback provides the individual with detailed information about a physiologic process that is typically not within the individual’s awareness. Through this detailed feedback, the individual can learn voluntary control over usually involuntary processes. Biofeedback for pain management usually entails providing feedback about muscle tension, typically using electromyographic (EMG) feedback from the site of the pain or a standard location such as the frontalis muscles, or feedback about skin temperature, typically using thermistors attached to the fingers. Empirical support for the efficacy of biofeedback for pain management exists for several specific painful conditions, including Raynaud’s phenomenon, tension and migraine headaches, vulvar vestibulitis, and low back pain. Although widely used in the field of pain medicine, particularly in conjunction with relaxation training, the empirical support for its specific efficacy beyond the general effects of relaxation strategies has not been widely demonstrated except in the treatment of headaches.⁶ For patients who have difficulty recognizing the physiologic changes that may accompany pain or stress, biofeedback may be useful in assisting them in recognizing these changes. Further, patients who are drawn to technology, or conceptualize their pain experience as a primarily physical phenomenon, may prefer a biofeedback approach to relaxation training.

COGNITIVE-BEHAVIORAL INTERVENTIONS

The demonstration that cognitive and emotional factors influence the experience of pain has encouraged the application of cognitive-behavioral theory (CBT) and treatment to the management of chronic pain.⁵ These interventions typically include components of the behavioral model, particularly relaxation training, and some components of operant conditioning. However, an emphasis is also placed on cognitive factors, such as attitudes and beliefs that underlie maladaptive emotional and behavioral responses to pain.⁹ Expert panels⁶ and meta-analyses⁸ have found good evidence for the use of cognitive-behavioral interventions for chronic pain management.^{8,10} The strongest support is in the treatment of individuals with low back pain, rheumatoid arthritis, and osteoarthritis pain.¹⁰ CBT has been shown to have a positive impact on pain intensity, pain-related interference, health-related quality of life, and depression among individuals with chronic pain.⁸

COPING SKILLS TRAINING

Patients engage in a range of coping responses to manage pain and related stressors. Some coping responses (e.g., activity avoidance) are associated with increased distress and suffering, while other coping responses (e.g., problem solving)⁵ are linked to better emotional and physical functioning. Specific coping skills are highly adaptive and effective for individuals with chronic pain, often including some of the strategies outlined above, particularly relaxation and pacing of activity level. Primary goals of coping skills training are to increase perceptions of pain as a controllable experience and decreasing the use of maladaptive coping

strategies. In this approach, the emphasis is on skill development and refinement. In the case of skill development, a new skill is introduced and patients are encouraged to develop and refine the skill during low pain periods before attempting to implement the coping skill during an actual period of pain exacerbation. The skill is shaped over time, so that the skill is gradually applied to increasingly challenging (i.e., painful) episodes as the individual becomes more proficient in that skill. A similar approach is taken to the application of many pain coping skills, including cognitive or behavioral distraction, relaxation, pacing of activities, and the appropriate use of social support. Attention is paid to factors that increase or decrease pain and these factors guide the application of pain coping skills.

COGNITIVE RESTRUCTURING

Cognitive restructuring focuses on the role of cognitive factors, such as attitudes, thoughts, and beliefs, in determining emotional and behavioral responses to pain. These interventions challenge negative self-talk, such as catastrophizing (e.g., “I can’t stand the pain anymore”), and replace these self-statements with more positive statements that reduce negative affect, emphasize control, and encourage adaptive coping (e.g., “This is a challenge that I have faced before and I can handle it this time.”). Catastrophizing is a particularly maladaptive response to pain that has been shown to correlate with depression and disability.⁹ In the context of treatment, patients are frequently asked to monitor their thoughts about their pain, or pain-related situations, identify negative thoughts, and generate more accurate, adaptive thoughts to replace the negative thoughts. The emphasis is on balanced thinking, not necessarily positive thinking. This self-monitoring process is supplemented with more in-depth discussions of the underlying attitudes and beliefs contributing to the negative thoughts.

HYPNOSIS

Hypnosis is another tool used for pain management that targets beliefs and attitudes about pain and aids in having more control over the pain experience. Hypnosis for pain management usually begins with an induction consisting of suggestions for focused attention and relaxation. This is usually followed by specific suggestions to alter how the pain is viewed or experienced.¹¹ Often, the treatment includes posthypnotic suggestions that the benefits experienced during the session—decreased pain intensity—will last after the session or that the individual will experience increased comfort when engaging in specific behavior such as taking a deep breath or touching the painful site. The goal when working with people with chronic pain is to teach them self-hypnosis so they can use the skill to reduce pain and discomfort outside of the treatment session. Hypnosis has been most widely applied and studied with pain due to cancer, and expert panels concluded that the use of hypnosis reduces chronic pain due to malignancies.⁶ There are also data supporting its efficacy in treating pain due to irritable bowel syndrome, temporomandibular joint disorders, and tension headaches. Meta-analyses indicate that hypnosis can lead to significant reductions in pain that are similar to those experienced

with the relaxation techniques described above. It is not clear whether hypnosis is effective beyond what is seen in these treatments.¹¹

SELF-MANAGEMENT AND PEER SUPPORT

Self-management (SM) group interventions, based on the principles of CBT, have gained widespread application with chronic conditions marked by pain, distress, and functional impairment. Key elements in self-management include developing knowledge about the health condition, self-monitoring progress, acquiring relevant skills, and problem solving.¹² SM interventions have improved outcomes in many conditions, including rheumatologic diseases,¹³ fibromyalgia,¹⁴ and depression.¹⁵ Because SM interventions are often provided in a group setting, they incorporate social support and peer interaction that may facilitate behavior change and maintain treatment gains. SM interventions can be provided by professionals, laypersons, or peers. More recently SM interventions using Internet and telecommunication technologies demonstrated improvements in pain and health distress and reduced health care utilization in persons with chronic low back pain.¹⁶ SM interventions are best conceptualized as one component of a multidisciplinary pain treatment plan.

MULTIDISCIPLINARY TREATMENT

There is significant evidence to support the use of multidisciplinary approaches that include psychological intervention, compared to single-discipline or unimodal approaches, particularly when the focus is on improving long-term outcomes of mood, daily functioning, return to work, health care utilization, and quality of life.^{10,17} The use of a multidisciplinary approach may also extend initial treatment gains over several years.¹⁰ While psychological intervention is an integral component of multidisciplinary pain management, it may be particularly important to target individuals whose psychological and behavioral characteristics may prevent them from benefitting from other aspects of the treatment plan. Individuals who are highly distressed, see their pain as uncontrollable, have highly negative life events, perceive themselves to be disabled, and have low readiness to engage in self-management are all at high risk to respond poorly to treatment.¹⁸

Attention to psychosocial health is a responsibility shared by all members of the multidisciplinary pain team beginning with the patient and family and including clinicians who are not formally identified as mental health providers. Early detection and referral for potential problems is a primary responsibility of physicians and other providers who are likely to encounter patients early in their pain career, as there is evidence that early intervention for psychological issues enhances outcome.¹⁹ Physicians who are managing chronic pain patients need to have an established relationship with a psychologist who has pain expertise. Referral to a specific provider, along with an explanation to the patient that places the referral within the biopsychosocial model of pain and indicates how the psychologist may be helpful to the patient will facilitate follow-through.

INPATIENT VERSUS OUTPATIENT CARE

While there are data to support the utility of multidisciplinary treatment for chronic pain,¹⁷ data to guide the clinician in determining whether the patient requires admission to an inpatient pain program are sparse. The decision to pursue admission to an inpatient program is based on clinical assessment of the patient and his or her environmental circumstances. Inpatient chronic pain programs offer the advantage of increased medical attention, close monitoring of positive and negative health behaviors, and a structured treatment setting. Inpatient admission may be appropriate for patients with nonmalignant pain of 6 months or more and (1) who require detoxification, (2) have major functional disabilities, (3) need intensive and extensive psychological or behavioral therapy, (4) need temporary removal from a detrimental home situation to refocus their lives away from the pain, and (5) have failed conventional methods of treatment. As part of admission planning both medical and psychological evaluations should be completed on an outpatient basis.

SUMMARY

A number of psychological interventions have been empirically demonstrated to reduce pain and suffering in patients with a wide variety of chronic pain syndromes. A typical course of treatment usually includes many of the behavioral and cognitive approaches detailed here and the specific

approaches utilized are tailored to the needs of the patient. These interventions are usually part of a multidisciplinary approach and are provided in conjunction with other pain interventions (e.g., medication, physical therapy). Although many patients with chronic pain may benefit from psychological intervention, certain subpopulations—those who are highly distressed, see their pain as uncontrollable, have highly negative life events, perceive themselves to be disabled, have low readiness to engage in self-management, and have problematic medication use (dose escalation, misuse, or underuse)—are likely to need psychological intervention to maximize treatment gains. As research develops, there will be a growing emphasis on matching psychological pain interventions with patient characteristics.²⁰ Based on existing literature, certain pain disorders (e.g., headaches) may be highly responsive to specific psychological interventions such as biofeedback, and these treatments should be considered a standard part of medical management. For individuals who are not suitable candidates for some medical or pharmacological treatment (e.g., chronic opioid therapy for the recovering substance abuser), psychological treatment may be considered an essential first-line treatment option. Modern pain theory, and the existing evidence base, indicate that psychological intervention should be a routine part of chronic pain management rather than a treatment of last resort.

REFERENCES

Access the reference list online at <http://www.expertconsult.com>