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ANESTHETIC TECHNIQUES IN PAIN MANAGEMENT (D WANG, SECTION EDITOR)

Psychological Characteristics of Chronic Pain: a Review of Current Evidence and Assessment Tools to Enhance Treatment

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Abstract

Purpose of Review The complicated nature of chronic pain involves an interplay between psychological and physical factors, often resulting in increased emotional distress and reduced quality of life. This review is designed to help the medical practitioner who is working with chronic pain patients to be aware of psychological assessment techniques that can add to comprehensive patient understanding and more effectively guide treatment. Enhanced ability to assess and understand the emotional life of the chronic pain patient provides a basis for intervening and treating more successfully.

Recent Findings There are a broad range of assessment techniques, some of which require a background in psychology and some that do not, that can identify psychological differences in chronic pain patients and serve to guide intervention strategies. Chronic pain is often comorbid with depression, anxiety, catastrophizing, and various ineffective coping strategies. Some patients, however, have demonstrated more adaptive and effective strategies for cognitively and behaviorally coping with pain and normalizing their lives. Proper assessment enables the individualization of treatment to overcome and/or build upon each patient's psychological frame of mind to maximize the potential for effective functioning.

Summary The use of standardized and documented psychological assessment techniques can lead to a better understanding of chronic pain patients and contribute in ways that can enhance response to medical treatment and improve quality of life. It is recommended that certain psychological tools be included to supplement the medical assessment of patients who have chronic pain. A basic assessment can include a short psychological-based clinical interview along with brief measures of depression, anxiety, and coping strategies. It is also recommended that the pain physician have access to professional psychological practitioners as a resource for more complicated assessments and psychological intervention services.

Keywords Psychological assessment · Anxiety · Depression · Catastrophizing · Coping strategies · Cognitive-behavioral therapy

Introduction

Pain is classified as chronic if it lasts for more than 3 to 6 months [1]. The chronicity of pain has implications for the physical and psychological functioning of those who must deal with it. By one estimate, the 1-year prevalence rate for chronic pain in the USA is approximately 43% [2]. While the worldwide prevalence rate is slightly lower at 38%, it still reflects the large number of individuals who experience chronic pain at any given time. Older individuals, females, and individuals of lower socioeconomic status tend to report higher incidences of chronic pain, yet these groups tend to be underrepresented in treatment [3]. In a survey of the type of pain most frequently reported, lower back pain was reported by 28% of those surveyed while headache and/or severe migraine (16%), pain in neck area (15%), and pain in the face or jaw (5%) were also frequently reported [2]. Additionally, the financial cost of chronic pain in the USA was estimated to be $635 billion in 2010 [3]. Given the personal and financial costs associated with chronic pain, it is in everyone's best interest to identify and utilize the most efficacious means of evaluating and treating pain patients. This often means employing a multidisciplinary approach.

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Chronic pain is complicated in nature and has implications beyond the physical well-being of individual pain patient. Psychological, behavior, and social factors are also impacted [4]. Chronic pain can have significant consequences for a patient's quality of life. Reduced engagement in activities, diminished time with family, and lost wages are just a few of the consequences of chronic pain. Multiple studies have demonstrated the influence of psychological factors in the development, persistence, and treatment of chronic pain [5, 6•]. While physicians who treat patients living with chronic pain are generally not specialists in understanding psychological factors, it would be of benefit for them to have a working knowledge of some of the more influential psychological factors. Additionally, knowledge of psychological assessment tools that have been shown to be helpful in guiding treatment towards more successful outcomes can only serve to improve patient care. The aim of this paper is to review psychological factors that impact on chronic pain and to identify psychological assessment methods that can be utilized at the beginning of treatment to help guide the treatment process.

Patient Factors

Patient factors and/or characteristics can have as great an impact on the outcome of pain treatment as the pain itself. While patients represent a heterogeneous group, there is value in identifying common psychological characteristics that have been shown to negatively impact treatment [7]. The relationship between pain and patient factors is likely bi-directional in nature [8]. This suggests that addressing the psychological factors that contribute to chronic pain can be just as important for treatment outcome as addressing the pain itself. Research has demonstrated that coping style, depression, anxiety, catastrophizing, and level of pain acceptance are important patient factors that impact treatment outcome [3]. Identifying these characteristics early in the treatment process can enable physicians to create targeted treatment plans to facilitate treatment. Bergbom et al. [8] found that detecting and treating relevant patient factors can have a positive impact on outcomes, further bolstering the notion that recognizing these issues is an important part of treatment. The following is a review of some of the more prominent psychological considerations that negatively impact treatment.

Depression

Chronic pain and depression are highly comorbid. Depression is the most common mental disorder to occur with chronic pain [5]. In community samples, approximately 20% of individuals with chronic pain are also depressed. That number increases to 50% in clinical populations [9••]. Women report higher levels of depression and chronic pain than men [10]. Depression in chronic pain patients is associated with poorer treatment response and decreased functioning. The relationship between depression and chronic pain is likely bi-directional in nature. Depression can contribute to the development of chronic pain and decreased pain tolerance. Conversely, factors such as the reduced engagement in pleasurable activities, decreased mood, and increased feelings of distress and helplessness that accompany chronic pain can further contribute to the development of depression [5, 11]. There may also be a biochemical factor that influences and intensifies both conditions. While the overlap between the two disorders can make diagnosis difficult at times and can complicate treatment, the best treatment outcome has been demonstrated by treating both disorders concurrently utilizing a multidisciplinary approach [11].

Anxiety

The prevalence rate for anxiety among chronic pain patients is almost double that of the anxiety found in community samples (35 v. 18%) [12••]. Pain-related anxiety leads to worse treatment outcomes and higher health costs [13]. Pain-related anxiety often leads to avoidance of activities and involvements which can exacerbate pain, in addition to creating problematic cognitive and affective experiences. Avoidance, when used as a coping mechanism, frequently has the unfortunate unintended side effect of maintaining the chronic pain through processes such as physical deconditioning [6•]. Vowles, Zvolensky, Gross, and Sperry [14] found that the cognitive components of anxiety, such as the rumination and anticipation of fear, when measured at baseline, predicted affective distress and perceived lack of control and pain severity in patients with chronic lower back pain. Although the research on the treatment of anxiety and chronic pain simultaneously is sparse, the work done on depression and chronic pain may be instructive given the similar underlying processes [13].

Coping Style

Coping style, when being discussed with regards to chronic pain, is generally defined as "the effortful (i.e., non-automatic) attempt to adapt to pain, or manage one's negative response to pain" [15]. In keeping with this definition, coping strategies employed to manage pain encompass a range of behavioral and/or cognitive techniques that can be adaptive or maladaptive, or both, depending on the strategy employed and/or the situation. For example, while avoidance can momentarily relieve anxiety or fear associated with pain, in the long run, it can serve to increase anxiety and fear responses, and also increase pain, defeating the purpose of the technique. More common adaptive coping strategies include relaxation exercises, distraction, positive self-statements, and ignoring [6•]. Coping strategies are refined by individual experiences and

are often quickly activated with little conscious thought or decision-making [16]. Pain-related coping strategies have predicted level of adaption, emotional distress, and functional disability in pain patients [6•].

Catastrophizing

Catastrophizing is a maladaptive coping strategy that refers to the tendency to "develop extremely negative thoughts about your plight such that even minor problems are interpreted as major catastrophes" [13]. Studies have shown that pain patients who use catastrophizing as a coping mechanism tend to report more pain than those who do not. In addition, pain tolerance in individuals who catastrophize is lower than patients with similar medical conditions whose coping strategies do not include catastrophizing [13]. Arnow et al. [17] found that catastrophic thinking was a significant predictor of pain-related disability. Additionally, catastrophizing has been associated with a passive coping style and increased emotional distress [6•].

Pain Acceptance

Pain acceptance is thought to generally encompass the willingness to engage in personally meaningful activities even when an individual is in pain, and the willingness to stop avoiding or trying to control pain [18]. Measures of adjustment to pain have indicated that pain acceptance is negatively correlated with physical disability, depression, and pain-related anxiety among other variables [18, 19]. In acceptance-based treatment, pain acceptance has been identified as the underlying variable that leads to patient improvement [18].

Psychological Assessment Methods

The assessment of psychological factors that influence chronic pain is best conducted within the bounds of a multidisciplinary team. Team members trained in the administration and interpretation of comprehensive psychological assessment techniques can add valuable insights to the assessment process. A multimodal approach involving a combination of clinical interview and self-report measures is more likely to provide a richer picture of a patient's current psychological state. Furthermore, conducting a clinical interview and administering self-report measures is unlikely to add considerable time, or burden, to the assessment process, and has the potential to yield information that can significantly affect treatment outcome. What follows is a description of several self-report measures that are useful in assessing the previously reviewed psychological factors, as well as the benefits of including a clinical interview as part of the assessment process.

Clinical Interview

Conducting a clinical interview with new chronic pain patients can add necessary and useful information that may otherwise be missed with self-report measures. During the interview, the clinician can inquire, in depth, about a variety of physical, emotional, and behavioral factors that might impact treatment. In addition to gaining an understanding of the patient's subjective experience of pain (e.g., quality, intensity, frequency), the interview can touch on coping styles, life before and after the pain started, losses, attachment styles, history of abuse, and other traumas. Furthermore, the interview can uncover the patient's pain-related fears, as well as catastrophic thinking that might hinder treatment. Protective factors that could aid in the treatment process can be identified during the clinical interview, adding an element that most self-report assessment measures do not consider [9••], which also subtly conveys the message that treatment will also include utilization of strengths and other protective factors. Finally, the face-to-face nature of the interview enables the assessor to make real-time observations of the patient's body language, facial expressions, and expressed affect while responding to questions. Among the observations that can be made are whether the patient displays a more open or closed posture when discussing certain topics? Does s/he become more animated at times and avoidant at other times? Does the person display fearfulness about taking risks such as returning to work or other normal activities? Observing these sometimes-unconscious behavioral actions has the potential to enrich the assessment of the patient's needs.

Beck Depression Inventory

The Beck Depression Inventory-II (BDI-II) is a 21-item, self-report measure whose score provides a severity rating for depression (i.e., scores provide an indication of minimal, mild, moderate, or severe symptoms). The measure evaluates cognitive, somatic, and behavioral symptoms of depression. Based on participants' responses to the questionnaire on how they have been feeling in the last 2 weeks, the BDI-II can be used throughout the treatment process to monitor changes in mood as treatment progresses [20]. Due to concerns with symptom overlap, the original Beck Depression Inventory has been used more frequently in chronic pain clinical trials [21]. However, studies have found that the BDI-II is a useful measure to include in the assessment of chronic pain at the start of treatment and throughout the process to monitor for ongoing signs of depression, despite any overlapping that occurs [22, 23].

Patient Health Questionnaire-9

The Patient Health Questionnaire-9 (PHQ-9) is the depression module of the Patient Health Questionnaire. It is a self-report measure that assesses depressive symptoms during the previous 2 weeks [6•]. The PHQ-9 has been well validated for the assessment of depression in medical settings and has a sensitivity and specificity for major depression of 88% [24]. The PHQ-9 is free to use without restrictions, making it a cost-effective alternative to the BDI-II. The measure has been found to be a valid screening instrument for patients with migraines [25]. One must, however, be cautious and not make a definite diagnosis from a nine-item screening test unless there is additional support.

Beck Anxiety Inventory

The Beck Anxiety Inventory (BAI) is a 21-item, self-report measure that assesses cognitive, somatic, and behavioral symptoms associated with anxiety [26]. Responses are limited to symptoms experienced in the past week. The BAI score indicates the severity of the current symptoms of anxiety (i.e., minimal, mild, moderate anxiety, and severe symptoms) [27]. Like the BDI-II, the BAI is useful for assessing anxiety at the start of treatment and during the treatment process due to its focus on assessing current symptoms. As previous studies have demonstrated that anxiety at the start of treatment can predict negative changes in quality of life [28], including the BAI in the initial assessment process can help identify anxiety-related concerns before they become too problematic.

Chronic Pain Coping Inventory

The Chronic Pain Coping Inventory (CPCI) is a 64-item self-report measure that evaluates illness and wellness-focused coping strategies. It consists of eight subscales, including guarding, resting, relaxation, and coping self-statements [6•]. Studies of the CPCI have demonstrated it is a valid and reliable tool for use with individuals with chronic pain. It is particularly helpful in identifying adaptive and maladaptive coping strategies that the patient might be employing to manage pain [29, 30].

The Coping Strategies Questionnaire

The Coping Strategies Questionnaire (CSQ) is a 44-item self-report measure that assesses six cognitive (e.g., diverting attention and reinterpreting pain) and one behavioral coping strategy (i.e., increasing activity). The CSQ directly assesses for catastrophizing, making its inclusion in the assessment process particularly helpful in evaluating the patient's reliance on catastrophizing as a coping technique [6•]. Additionally, scores on the catastrophizing subsection of the CSQ has been shown to be accurate at predicting different adjustment outcomes to chronic lower back pain [31].

Chronic Pain Acceptance Questionnaire

The Chronic Pain Acceptance Questionnaire (CPAQ) is a 20-item self-report measure that assesses acceptance of chronic pain. It consists of two subscales: Active Engagement and Pain Willingness [32]. Active Engagement refers to the patient's willingness to engage in activities despite the presence of pain, while Pain Willingness evaluates a patient's ability to experience pain without engaging in efforts to avoid or control it [33]. There is evidence that a high CPAQ score at the beginning of treatment can predict adjustment to pain over the course of treatment, and improvement in emotional and social functioning following interdisciplinary treatment for pain can increase CPAQ total scores [19].

Millon Behavioral Medicine Diagnostic

The Millon Behavioral Medicine Diagnostic (MBMD) is a 165-item self-report measure designed to assess psychosocial factors that might interfere with treatment including Axis I disorders and coping styles. The test also includes a measure of treatment prognosis [34]. The inventory was normed on individuals with chronic medical conditions and consists of 37 scales including scales that specifically assess coping [35]. With a completion time of about 20–25 min, the MBMD does not require a great deal of time investment by patients [4]. Cipher et al. [35] found that coping styles, as identified by the MBMD, were associated with improvement in several psychosocial factors such as depression, anxiety, and affective distress from pre- to post-treatment. Other studies have likewise found that the MBMD is able to predict which patients are able to make improvements in pain treatment programs [4].

Minnesota Multiphasic Personality Inventory

The Minnesota Multiphasic Personality Inventory Form (2 or 2-RF) is a lengthy empirically derived test, with the MMPI-2 having 567 items and the MMPI-2-RF having 338. Since the original MMPI was published in 1940, the various forms of the test have been the most widely researched of any of the "objective" personality tests. In addition to addressing significant psychological conditions such as depression, anxiety, paranoia, and schizophrenia, it also looks at how much focus there is on somatic and cognitive conditions with various subscales measuring gastrointestinal complaints, head pain complaints, neurological complaints, cognitive complaints, and

malaise. The test also has several validity scales designed to sort out the over-reporting or under-reporting of complaints. Because of the large number of individual scales, analysis of patterns is important, and test interpretation should only be done by a trained examiner or through a validated computer program [36, 37].

Treatment Recommendations

Once psychological factors impacting chronic pain have been identified, there are multiple adjunctive psychological treatment approaches that can be used to address these problems. These approaches do not require lengthy time in treatment and can be carried out at the same time as pain treatment by a physician.

Cognitive Behavioral Therapy (CBT) for chronic pain has been demonstrated to be a well-documented effective intervention for a variety of chronic pain problems [38]. CBT, which aims to bring about changes in patient's cognitions and behaviors, has shown positive results in lowering depression and reducing pain-related disability in chronic pain patients [18]. Though not yet as well researched as CBT, studies conducted on the efficacy of Acceptance and Commitment Therapy (ACT) for chronic pain has yielded promising outcomes [39]. When utilized in treatment, ACT has improved pain acceptance which is associated with an improvement in treatment outcome [18]. ACT promotes psychological flexibility at its core and directly addresses acceptance as part of its treatment module. Positive Psychology (PP), another of the newer treatment modalities, focuses on recognizing and/or fostering of individual strengths and resources. Though it is less well researched with the chronic pain population, a recent study has demonstrated that chronic pain patients treated with PP exhibited reductions in pain intensity, catastrophizing, pain interference in life activities, and life satisfaction [40]. In addition, Peters et al. [41] conducted a novel internet-based positive psychology self-help treatment program for chronic musculoskeletal pain patients that led to increased happiness and reduced depression in the experimental group despite the fact that there was no significant decrease in physical symptoms compared with the waitlist group. Because positive psychology is a strength-based approach that focuses on thriving rather than primarily addressing pathology [42], it offers a hopeful new way of treating chronic pain, although it awaits further research.

Conclusion

Chronic pain is a prevalent condition that can have significant implications for those it impacts. As such, it behooves chronic pain practitioners to utilize all available methods to assess and treat chronic pain. By assessing for the psychological factors that contribute to the onset and persistence of chronic pain, physicians can develop a comprehensive picture of their patients' pain profiles. Most of the assessment tools covered in this article are brief and easy to administer at the beginning of treatment to establish a baseline and throughout treatment to assess change. Though the MMPI (2 or 2-RF) requires more time and specialized knowledge to interpret, its comprehensive nature and well-validated use with multiple populations make it useful for this population. Once relevant psychological factors are identified, physicians can apply various psychological treatment modalities to supplement the medical treatment. Modalities such as CBT, ACT, and PP can offer patients non-pharmacological, non-invasive ways of addressing their chronic pain and can complement the challenging work of the pain physician.

Compliance with Ethical Standards

Conflict of Interest Rhondene M. Miller and Ronald S. Kaiser declare no conflict 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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