Chapter 2
Emotional Aspects of Chronic Pain

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Abstract Emotions and chronic pain are deeply entangled. Emotions can predispose to or modulate pain. Various factors pertaining to negative affectivity can contribute to pain intensity and chronicity, as well as to its disabling consequences. In the last decade, advances in neurosciences have indisputably confirmed the clinical evidence of pain as an experience involving sensory and emotional components, emphasizing the essential role of brain structures related to motivation and emotions, pointing to central sensitization or to epigenetic influences on affect regulation disorder. Contemporary theories call upon integrative models that reflect the history and personal vulnerabilities as much as the emotional and cognitive factors that may influence pain. In patients with chronic pain, interpersonal dimensions also received renewed interest, and in particular attachment or somatization and alexithymia as specific modes of expressing emotions. Therapeutic approaches increasingly emphasize motivation as well as acceptance of pain and goal achievement despite the presence of pain.

2.1 Chronic Pain and Emotions in the Biopsychosocial Model

Pain and suffering are at the same time totally universal and strictly personal experiences; they are universal insofar as they are common to all individuals whatever the individuals' personal characteristics and social or cultural memberships, and they are personal because of their subjective characteristics and the difficulty in

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conveying them to others. Pain is thus somehow at the crossroads of the individual and the group. This sets into play physiological and psychological mechanisms, and it is also inserted within the social context to which the individual belongs. This context contributes to modulate variables such as the meaning and the expression of pain which in turn influence pain-related adjustment.

This review on the relationships between chronic pain and emotions is embedded within a biopsychosocial perspective on pain with a reference to clinical practice (Allaz 2003; Gatchel et al. 2007; Lumley et al. 2011). This relationship has been described as including dimensions of pain that have been termed "awareness," "expression," "experiencing," and "modulation" (Lumley et al. 2011). The biopsychosocial perspective requires a comprehensive concept of pain, including sensory, affective, and cognitive dimensions. In the biopsychosocial model, the somatic basis of pain is acknowledged, even if the cause of nociception cannot be identified. When pain becomes chronic, psychosocial factors become increasingly important so that a number of psychological, social, and physical traits are considered simultaneously. Such a multidimensional model acknowledges chronic pain as a dynamic process that results from an ongoing interplay between physical and psychological characteristics. It also stresses the multifaceted nature of pain as well as the considerable overlap that exists between variables and also the entanglement of psychological processes. This chapter is divided into categories that are to some extent artificial but that allow the reader to consider more easily the relative contribution of each factor. The review focuses on state-of-the-art knowledge as well as treatment and research current trends.

2.2 Depression and Affective Disorders

Depression is the dominant affective state associated with pain (Dersh et al. 2002; Gatchel et al. 2007). Its prevalence in most clinical surveys with chronic pain patients varies between 20 and 70 % that is three to five times more than in primary care patients (Bair et al. 2008; Demyttenaere et al. 2007). The prevalence is even higher in unexplained widespread chronic pain (Raphael et al. 2006). The association is demonstrated across different chronic pain syndromes and in all age cohorts (Egger et al. 1999; Lenze et al. 2000; McWilliams et al. 2004). Moreover, more than half of the patients suffering from a major depressive episode present with pain (Demyttenaere et al. 2006). A large international prospective cohort study showed that the initial presence of chronic pain predicted the occurrence of psychological disturbances as much as such disturbances predicted the occurrence of pain (Gureje et al. 2001). Hence, whereas chronic pain can undoubtedly cause a depression, the presence of depression also represents a predisposing factor to the onset and chronicity of pain (Jarvik et al. 2005). Depression has been shown to be predictive of chronicity and prolonged time to recovery in low back pain (Edwards et al. 2011), postherpetic neuralgia, rheumatic diseases (Goldenberg 2012), and in most if not all chronic pain syndromes (Garcia-Cebrian et al. 2006). Are pain and depression

distinct or common entities? The high prevalence of the association between the two syndromes and the many clinical and neurobiological similarities are consistent with the long-standing hypothesis of a single entity described as "affective spectrum disorder" (Hudson and Pope 1989) or more recently as "pain-depression dyad" (Goldenberg 2010). However, this unifying theory remains controversial (Garcia-Cebrian et al. 2006). For most clinicians and researchers, depression and pain are separate entities (Bair et al. 2003; Hennigsen et al. 2003; Katon et al. 2007). In the clinical setting, the central issue seems to be identifying and not trivializing the presence of depression. This may represent a challenge due to the frequent reluctance of chronic pain patients to give voice to their affective states. Whatever the difficulty, discussing the possibility of a depressive mood with chronic pain patients is central as the treatment of depression leads to undisputed benefits, including in elderly people.

2.3 Anxiety

Although anxiety has attracted less attention than depression, a growing body of research supports the association between the various clinical presentations of anxiety and chronic pain syndromes (Asmundson and Katz 2009; Kroenke et al. 2013). The presence of anxiety disorders or panic attacks is particularly documented in headaches, fibromyalgia (Raphael et al. 2006), and abdominal pain, including in children and elderly people (Lenze et al. 2000; McWilliams et al. 2004). The prevalence of anxiety may be as high as 35–50 % in chronic pain patients (Kroenke et al. 2013; McWilliams et al. 2004) or two to three times higher in people complaining from chronic back pain as compared to pain-free individuals (Demyttenaere et al. 2007).

Anxiety can be expressed in various ways. The documented effect in lowering pain thresholds (Rhudy and Meagher 2000) as well as the enhanced attention to experienced feelings and sensations (Carter et al. 2002) can account for pain amplification. A "hypochondria" dimension with its associated anxious concerns and focus on painful sensations often leads to repeated requests for additional consultations or investigations. Anxiety can also be manifested primarily in the form of physical pain states: tightness, constriction, or atypical chest pain, the latter especially during panic attacks (Huffman and Pollack 2003). In fact, the majority of patients with panic attacks report pain symptoms of one type or another (Schmidt et al. 2002). Post-traumatic stress disorder (PTSD) is often considered as an anxiety disorder. In this syndrome, the report of chronic pain is also very high (McWilliams et al. 2004) with prevalence up to 50–80 % in military veterans (Asmundson et al. 2002).

The co-occurrence of anxiety disorder is surprisingly high among patients with chronic pain. It should be systematically evaluated and taken into account, in view of its impact on the experience and presentation of the pain complaint and its repercussions on patients' distress and quality of life (Asmundson and Katz 2009; Kroenke et al. 2013).

2.4 Anxious Concerns and Negative Beliefs

Anxious concerns are far from uncommon; for example, they are apparent in the fears that evolve into paralysis in low back pain patients or the impression that the disease is gaining ground in patients suffering from fibromyalgia (Cedraschi et al. 2012). They can contribute to a significant decrease in quality of life. However, they may not always be expressed spontaneously, because they are seen as possibly too bizarre or disturbing to be verbalized.

Encompassed in the concepts of fear of pain, pain-related anxiety, or fear avoidance, expressions of fear and anxiety are known to contribute significantly to the development of chronic pain and of disability, even more than pain intensity itself (Crombez et al. 2012). The fear-avoidance model is a theoretical model that describes how psychological factors affect the experience of pain and the development of chronic pain and disability (Crombez et al. 2012). This model builds on the importance of the beliefs patients hold about their pain and their role in promoting disabling fear and avoidance. Beliefs have been defined as assumptions about reality which serve as a perceptual lens or a mental set through which events are interpreted, thus shaping an individual's understanding of his/her environment and influencing the individual's coping responses (Lazarus 1993). Inappropriate beliefs such as the belief that back pain is harmful or potentially severely disabling or an expectation that passive treatments rather than active participation will help have been described as warning signs ("yellow flags") of an increased risk of developing or perpetuating pain and long-term disability associated with low back pain (Nicholas et al. 2011) and thus are seen as barriers to adjustment and recovery.

In the fear-avoidance model, negative beliefs about pain lead to a catastrophizing response in which patients "imagine the worst possible result that could happen, but accept it as the given result" (Linton and Shaw 2011). This leads to fear of pain, fear of activity, and avoidance that initiate disuse and generate distress. This may in turn reinforce the primary negative appraisal and set into motion a vicious circle that inhibits patients' commitment and consequently eventual therapeutic progress. This model also theorizes that patients who do not display catastrophizing responses and fear-avoidance beliefs are more likely to confront pain problems and engage actively in the recovery process (Vlaeyen and Linton 2000).

2.5 Catastrophizing

Pain catastrophizing has been defined as an exaggerated negative cognitive set brought to bear during actual or anticipated pain experience (Sullivan et al. 2001). The conceptualization of catastrophizing is that of a unitary construct, comprising three dimensions: magnification, rumination, and helplessness. *Magnification* refers to the tendency to magnify or exaggerate the threat value or seriousness of the pain sensations; *rumination* refers to thought content reflecting worry, fear, and the inability to divert attention away from pain; and *helplessness* reflects elements of

pessimism and helplessness in relation to the ability to deal with the pain experience (Sullivan et al. 2001).

Catastrophizing has been associated with chronicity in various pain syndromes, including low back pain and fibromyalgia. A recent systematic review investigating the role of catastrophizing as a prognostic factor in patients with low back pain showed conflicting results about the association between catastrophizing and the future course of pain and disability. Interestingly, however, studies using cutoff values suggested the presence of a "dose-dependent" effect of catastrophizing (Wertli et al. 2014). Another review examining pain, catastrophizing, and depression in the rheumatic diseases including fibromyalgia stressed that catastrophizing and depression are risk factors for various adverse pain-related outcomes such as physical disability, increased pain severity, and pain sensitivity (Edwards et al. 2011). Indeed, pain-related catastrophizing has been shown consistently to be associated with greater pain and physical and psychosocial dysfunction among individuals with chronic pain (Linton and Shaw 2011; Nicholas et al. 2011). It has also been shown that pain-related catastrophizing thoughts tend to be stable rather than variable over time in the absence of an intervention targeting catastrophizing or a reduction in pain or depression (Turner et al. 2004). It is thus easily understandable that among the cognitive and affective factors influencing pain, catastrophizing has been termed a key determinant in different types of chronic pain syndromes (Smeets et al. 2006), associated with emotional and behavioral responses (such as pain-related fear and avoidance) that predict consequent levels of depression and disability (Leeuw et al. 2007).

The exact positioning of the concept of catastrophization is still debated; however, it is an independent factor, acting as marker of distress and of particular interest as it may provide a therapeutic target (Smeets et al. 2006). Recent developments in this concept also suggest a relational model ("communal model of pain catastrophizing") where pain catastrophizing is considered a way of expressing distress to one's significant others; however, while aimed at seeking empathy and support, pain catastrophizing often induces negative attitudes in the patient's social environment (Cano et al. 2009).

2.6 Perceived Injustice and Anger

Perceived injustice in the context of injury and pain is construed as an appraisal cognition encompassing the *severity of loss consequent to injury*, the *irreparability of loss*, *blame*, and a sense of *unfairness* (Sullivan et al. 2008). Although perceived injustice has been conceptualized as a construct distinct from catastrophizing, various studies have stressed that perceived injustice is highly correlated with pain catastrophizing, pain-related anxiety, and depression (Sullivan et al. 2012). Scott and Sullivan (2012) have shown that perceived injustice moderates the relationship between pain severity and depressive symptoms; drawing from their work, they also suggest that catastrophizing might be a precursor to perceiving injustice, such that individuals might first need to appraise pain as a catastrophe before viewing it as irreparable.

Recent research has also uncovered the impact of perceived injustice on pain intensity, physical and psychological recovery, and rehabilitation in general (Sullivan et al. 2012). Interestingly, it has been proposed that "just world" beliefs may have a buffering effect on psychological distress in chronic pain patients, so that patients with lower levels of pain, disability, and psychological distress may experience life events as more "just" than patients who experience more severe pain, disability, and distress (McParland and Knussen 2010).

Anger as an emotional aversive reaction contributes to the feeling of injustice. It has also been described as playing a significant mediational role in pain intensity, psychological distress, and disability as well as in the chronification process (Trost et al. 2012). Recent work indicates that anger intensity and anger inhibition mediate the relationship between perceived injustice, pain, and pain outcomes (Scott and Sullivan 2012; Scott et al. 2013), and in particular, it is suggested that both state anger, that is, a characteristic of the individual, and anger inhibition (i.e., an expression style referring to attempts to suppress feelings of anger) contribute to a large extent in explaining the impact of perceived injustice on pain intensity and may also be one of the mechanisms through which perceived injustice influences depressive symptoms (Scott et al. 2013). Attribution of blame is part of the process, as an antecedent of perceived injustice and anger reactions. The attribution of blame to external sources (e.g., to traumatic events) contributes to greater levels of anger and higher perceived injustice, eventually increasing feelings of hopelessness and helplessness and leading to the more or less conscious adoption of a victim role. The therapeutic alliance may be at risk when perceived injustice and anger lead to hostility or requests for compensation (Trost et al. 2012). Therefore, in clinical practice, identifying feelings of anger and injustice and working on anger regulation (i.e., on inhibition and expression of anger) can help prevent misunderstandings and maintain the therapeutic relationship. The difficulty of managing conflict and the repression of anger have been thoroughly described in patients with alexithymic traits (Nemiah and Sifneos 1970). This repression of emotions, and in particular of negative emotions, has also been associated with higher pain intensities, greater adjustment difficulties, and heightened physiological reactivity. Interestingly, it has been shown that while anger inhibition triggers greater sustained muscle tension than anger expression, the deleterious effects of inhibition are particularly salient in those individuals who report a predominant disposition ("trait-anger") to express anger in an outward fashion (Burns et al. 2008). These data cover a wide range of biopsychosocial reactions and thus testify to the importance of not neglecting anger and its correlates whose expression may vary from one individual to another.

2.7 Trauma

The association between pain and traumatic experiences has long attracted the attention of pain specialists. Indeed, traumatic experience often represents one of the very central dimensions of suffering in patients with chronic pain, way beyond

the classical association between chronic pain and PTSD. On one side, as described above, patients' attribution of their symptoms to traumatic events is far from exceptional (Cedraschi et al. 2013). This can elicit feelings of anger or injustice and lead to involvement in compensation claims. On the other hand, since Engel's description of the "pain-prone-patient" about 50 years ago, chronic refractory pain has often been associated with a history of abuse, neglect, or childhood trauma. From the epidemiological standpoint, data associating pain and abuse are very impressive (Davis et al. 2005). It is particularly prevalent in patients suffering from chronic unexplained pain syndromes like fibromyalgia (Imbierowicz and Egle 2003) or chronic pelvic pain in men (Hu et al. 2007) and in women (Lampe et al. 2003). Lately however, interest has shifted from abuse per se to emphasize the central importance of the dimension of neglect or abandonment (Landa et al. 2012). The importance of chronic stress has also been emphasized in this context (Van Houdenhove and Luyten 2005).

Traumatic experience such as child abuse or neglect has been linked with long-standing affective regulation disorders, being associated with difficulties with emotional disclosure and expression (Katon et al. 2007; Raphael et al. 2001). In the clinical encounter, reluctance to talk about personal history and difficulties in creating trusting relationships may point to the existence of such traumatic experiences, especially when a seemingly minor event leads to a perplexing intractable pain or disability.

2.8 Somatization and Alexithymia

The association between affect regulation disorder and the tendency to express distress by means of somatic symptoms has been consistently linked with the concept of *alexithymia*, literally meaning no words to express emotions (Nemiah and Sifneos 1970). Alexithymia is closely linked to the concept of somatization (Mattila et al. 2008). Lipowski (1988) has proposed a widely used, broad, and pragmatic definition of somatization: "the expression of an intrapsychic or psychosocial distress through bodily complaints (for instance pain), followed by medical consultation." In brief, emotional problems or mental suffering in general can be expressed in a somatic channel and take the "mask" of pain. Pain is the dominant mode of somatization in both primary care and specialized consultations, throughout different cultures (Gureje et al. 2001).

The process of somatization continues to challenge clinicians and researchers. Freud's masterly description of the "conversion" of an intrapsychic conflict into a bodily symptom (Strachey et al. 1955) has been followed by numerous developments especially in the psychosomatic field. The question of the origin and meaning of the symptom remains debated, whereas many models attempt to explain the process of somatization. The preferred expression of distress through bodily symptoms may be related to several different factors. We will only mention here the most relevant ones. The neurobiological and neuropsychological entanglement between

pain and emotions is now largely supported (Apkarian et al. 2005; Roy et al. 2009). Psychological factors are of major importance with alexithymia as a central phenomenon. The great difficulty with awareness and expression of emotions at the core of this concept makes the link with the frequently observed somatic expression of mood disorders and of depression in particular (Egger et al. 1999; Katon et al. 2007). As mentioned, a history of trauma or neglect during childhood is strongly associated with the presentation of multiple somatic symptoms and alexithymia (Joukamaa et al. 2008; Raphael et al. 2001). There is growing evidence that epigenetic factors, that is, the modulation of gene expression by environmental factors like affective deprivation or trauma, can be major contributors (Mehta et al. 2013). Behavioral and social factors emphasize the role of reinforcement to explain the presentation of distress through a bodily channel. Somatization may correspond to learned attitudes and behaviors (e.g., "painful families") who express any distress through painful complaints or to a social reinforcement, thereby facilitating entry in the healthcare system (Nettleton 2006). From an anthropological point of view, somatization can be understood as a culture-bound mode of communication. In psychodynamic terms, somatization is understood as a "shortcut of the psyche" acting as a protection or a defense against an unbearable suffering like grief or melancholy (McDougall 1989). To avoid the suffering related to a loss (real or symbolic), the individual unconsciously overinvests a body space that becomes difficult to cure (Nissen 2000). Globally, painful symptoms and pain behavior can be considered as a message of distress (Allaz 2003).

2.9 Attachment Styles

Bowlby's hypothesis that early experiences with caregivers are forming models of relationships later reproduced throughout life is widely known as "attachment theory" (Bowlby 1977). It comes of no surprise that affect regulation disorder associated with somatization and trauma is correlated with difficulties in interpersonal relationships, manifested as an "insecure attachment style" (Landa et al. 2012). Vulnerability in interpersonal encounters and high sensitivity to rejection associated with little ability to create trusting bonds are hallmarks of the insecure attachment style, mirroring observations made in clinical practice with chronic pain patients (Ciechanowski et al. 2002). The difficulties in creating interpersonal relationships can in turn contribute to the difficult construction of the therapeutic alliance (Allaz 2003).

The dimension of attachment has recently attracted renewed interest in the field of pain and has been the subject of recent reviews (Lampe et al. 2003; Meredith et al. 2008; Porter et al. 2007). Various studies have shown that an insecure attachment style contributes to high pain intensity and disability, to feeling pain as a threat, and to a higher degree of pain-related distress (Meredith et al. 2008). Insecure attachment is also correlated to high levels of depression, anxiety, and catastrophization and to a tendency to express distress in a somatic way, in children as well as in adults (Landa et al. 2012; Porter et al. 2007). Globally, attachment disorders

represent a strong vulnerability for difficult adjustment to pain as described in the attachment-diathesis model of chronic pain (Meredith et al. 2008).

Interestingly, in a related field, the hypothesis of a close neuroanatomical relationship between pain and suffering related to social rejection has recently attracted a lot of attention (Eisenberg 2012).

2.10 Clinical Evidence Strengthened by Advances in Neurosciences

For pain specialists, and in particular for psychotherapists, it is highly gratifying to see that major recent advances in neurosciences and neuroimaging have indisputably confirmed the clinical evidence of pain as an experience involving both sensory and emotional components. The essential role of brain structures related to motivation and emotions has indeed been widely demonstrated (Apkarian et al. 2005; Roy et al. 2009). Such advances as the evidence of central sensitization (Desmeules et al. 2003), epigenetic influences on affect regulation disorder (Mehta et al. 2013), and the neuroanatomical closeness of pain and social rejection (Eisenberg 2012), among others, reinforce evidence of the strong and mutual link between pain and emotions. Globally, the major advances of the neurosciences in the last decade not only allow for a better understanding of the complexity of pain experience but also of the development of personal vulnerabilities. Hopefully, these notions – when shared with the patients – will contribute to a common understanding of the complex modulation of emotions on pain chronification and to minimized misunderstandings in the therapeutic relationship. Taken together, contributions from the neurosciences brings as much a confirmation of the importance of emotional dimensions as new insights into the way we should acknowledge chronic pain patients. As Lumley et al. (2011) suggested: "At a minimum, we encourage clinicians working with patients who have persistent pain to at least inquire about – if not explore at length – [emotional] issues."

2.11 Coping with Pain: Toward a Shift in Paradigm?

Cognitive-behavioral therapy (CBT) has become the prevailing treatment for patients with chronic pain associated with psychological distress and disability (see also Chap. 10: Nicholas). Cognitive (e.g., reframing, examination of automatic thoughts, guided imagery) and behavioral (e.g., in vivo exposure, operant or respondent learning) techniques are used to modify thinking about and behaving with pain. There is evidence that CBT-based treatments are effective in various chronic pain disorders, with only moderate effect sizes, however (Veehof et al. 2011).

In recent years, therapies based on acceptance have received growing interest. In these therapies, the focus is on acceptance of pain and goal achievement (McCracken et al. 2004). Acceptance requires that the individual continues the activities he/she

values and keeps his/her commitment to his/her personal goals despite the presence of pain and that he or she stops devoting time and efforts to control or avoid pain and difficult experiences (McCracken et al. 2004; Sullivan et al. 2012). Acceptance of pain has been associated with lower pain intensity, lower degrees of pain-related fear, and avoidance of psychological distress and of disability (McCracken and Zhao-O'Brien 2010). It has also been evidenced that patients with higher levels of acceptance display less pain catastrophizing and that readiness to experience difficult personal events to pursue one's goals has a positive impact on the orientation toward present or anticipated pain experiences (de Boer et al. 2014).

This interest in pain acceptance may call for a paradigm shift toward approaches that better consider the patients' motivational capacities or, in some instances, resistance to treatment (Crombez et al. 2012). As such, these approaches take some distance with treatment strategies described hitherto as effective for all patients. This third-generation cognitive-behavioral therapies have been labeled acceptance and commitment therapy (ACT). ACTs are centered on acceptance, confrontation, and also mindfulness, that is, a state of intentional and nonjudgmental awareness and focus on the present moment (Veehof et al. 2011). It is noteworthy that recent publications bear witness to the development of studies and therapeutic options taking this dimension into account, and notably ACT. A topical systematic review and meta-analysis of acceptance-based interventions showed that mindfulness-based stress reduction programs and ACT have small to medium effects on pain, depression, anxiety, physical well-being, and quality of life; they are thus not superior to CBT but do provide good alternatives (Veehof et al. 2011).

2.12 Conclusion: Emotional Dimensions in the Clinical Encounter

In clinical pain practice, the importance of taking into account individual capacities, stages of life, as well as patient preferences, doubts, or resistance to treatment cannot be underestimated. The goal of treatment remains mainly rehabilitative in primary as well as specialized care. Due to frequent resistance to personal disclosure, referral of the patient to a specialist is not always indicated. Nevertheless, a recent systematic review emphasizes the beneficial effect of psychotherapy on psychological distress, disability, quality of life, and, to a lesser extent, pain (Williams et al. 2012).

An important emerging trend involves the development of integrative and developmental models of chronic pain (Landa et al. 2012; Meredith et al. 2008). Being aware of the documented consequences of a traumatic environment on the expression of distress, on the regulation of affect including feelings of anger or catastrophization, and on the capacity to create trusting relationships can help to better manage misunderstandings and interpersonal difficulties in the care of chronic pain patients. Therapeutic alliance remains sometimes difficult to build and requires a personal commitment of the pain therapist, whatever his/her specialty. The issue of emotional experience and of maintaining a good capacity for empathy in the therapists has not been discussed here. Yet, these issues deserve very close attention in the clinical context.

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