

**THE ROLE OF CLINICAL PSYCHOLOGISTS IN THE MANAGEMENT OF LOW BACK PAIN  
(LUMBO-SACRAL DYSFUNCTIONS)**

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***Abstract***

*This paper focuses on the role of clinical psychologists in the management of low back pain and the development of persistent pain and disability. How basic psychological processes have been incorporated into theoretical models that have implications for physical therapy. To this end, the key psychological factors associated with the experience of back pain are synthesized, and an over view of how they have been integrated into the major models of pain and disability in the scientific literature is presented. Low back pain has clear emotional and behavioural consequences that influence the development of persistent problems and the outcome of treatments. It seems that individuals who suffer from low back pain, more often than others, have aggression problems and weaknesses in their ego function and more frequently have problems in their interpersonal relations. Besides this psychological factors are not routinely assessed in physical therapy clinics, nor are they sufficiently utilized to enhance treatment. Based on a review of the scientific evidence, a set of ten (10) principles that have likely implications for clinical practice is offered. This is because clinical psychological processes have an influence on both the client's experience of back pain and the treatment outcome. The integration of psychological principles into physical therapy treatment would seem to have potential to enhance outcome.*

***Keywords: role of Clinical Psychologists, Psychological theories, Management, implications and low back pain.***

**Introduction**

Low back pain in its most basic form can be described as an unpleasant physical sensation resulting from a variety of outside stimuli, from a pin prick to a serious burn. However, back pain is a complex experience that eludes simple definitions. Not only does the central nervous system play a crucial role in the experience of pain, but emotional and behavioural consequences can also affect how an individual perceives back pain. Most back pain results from the intense stimulation of nerve endings beneath the skin that serves as the body's alarm system for detecting injury. For the majority of people, such pain is immediate and intense. However in certain situations, the feeling of pain may be delayed or may fail to occur altogether (as sometimes happen with soldiers in the midst of battle). Another baffling aspect of pain is its persistence after the source of pain is gone; phantom limb pain that continues even after the injured limb has been amputated. Back pain is a subjectively- experienced event brought about by the dynamic interaction of biological, psychological, and social variables. Since back pain is experienced differently by different individuals, it becomes important to assess not only physical causes that might account for its presence, but also personal variables that may contribute to it. This includes cognitive, affective, and behavioural factors which the individual brings into the situation.

In examining the role of clinical psychologists in the management of low back pain, we must look at the issue of the individual psyche. Psyche of course means the mind, behaviour and experience of each individual. Every individual has a psyche governing the way he perceives realities (things) how he is motivated, the way he behaves. The psyche is governed by the individual life history including his disposition and environment and the history of the race handed down from generation to generation. A group has also a psyche produced through collective living, collective goal setting, collective experience, collective joy and sadness and indeed collective destiny.

In contemplating the present study, the researcher's understanding of the true role of the clinical psychologist is that he/she is at once a healer of persons in distress, a healer of families in distress, a healer

of institutions in distress and ultimately, a healer of his or her nation. Indeed, the role of the clinical psychologist goes beyond healing, but most significantly incorporates efforts at prevention of pathology in all the above stated domains. He/she also deals with the assessment and treatment of individuals who have mental, emotional, or physiological disorders. This is the approach in this study. First, though, let us give life to the study through a brief explanation of the concepts of pain.

### **What is Pain**

In 2014, the major professional organization specializing in pain – the International Association for the study of pain (IASP) – introduced the most widely used definition of pain: “an unpleasant sensory and emotional experience associated with actual or potential damage, or described in terms of such “damage”. This pain is a complex experience that includes both physical and psychological factors. It is quite normal to have emotional reactions to acute low back pain. These reactions can include fear, anxiety and worry about what the pain means how long it will last and how much it will interfere with activities of daily living. Though it’s normal to avoid activity that causes pain, complete inactivity is ill-advised. Rather, it is important to take an active role in managing pain by participating in physician-guided activities. Pain in the lower back may be linked to the bony lumbar spine, discs between the vertebrae, ligaments around the spine and discs, spinal cord and nerves, lower back muscles, abdomen and pelvic internal organs, and the skin around the lumbar area (IASP, 2014).

### **Signs and Symptoms of Low Back Pain**

A symptom is something the patient feels and reports, while a sign is something other people, such as the doctor detect. For example, pain maybe a symptom while a rash may be a sign. The following signs and symptoms accompanies low back pain;

- Weight loss.
- Elevated body temperature (fever).
- Inflammation swelling on the back.
- Persistent back pain - lying down or resting does not help.
- Pain down the legs.
- Pain reaches below the knees.
- A recent injury, blow or trauma to your back.
- Urinary incontinence - you pee unintentionally.
- Difficulty urinating - passing urine is hard.
- Fecal incontinence - you lose your bowel control.
- Numbness around the genitals.
- Numbness around the anus.
- Numbness around the buttocks.

According to the National Health Services (NHS), UK (2010), the following groups of people should seek medical advice if they experience low back pain:

- People aged less than 20 and more than 55 years.
- Patients who have been taking steroids for a few months.
- Drug abusers.
- Patients with cancer.
- Patients who have had cancer.
- Patients with low immune systems.

### **Causes of Low Back Pain**

The human back is composed of a complex structure of muscles, ligaments, tendons, disks and bones the segments of our spine are cushioned with cartilage like pads. Problems with any of these components can lead to back pain. In some cases of back pain, its cause is never found. According to American Psychological Association (2011), stress is the major causes of back pain. When we go through periods of chronic stress, the brain uses a diversion tactic to protect us emotionally. That diversion is to manifest real physical pain, often in the lower back region. Linton (2004) stated that individuals who suffer from low back pain, more often than others, have aggression problems and weaknesses in their ego function and more frequently have problems in interpersonal relations and sexual problems. Some people also often misdiagnose themselves or accept a mistaken diagnosis that attributes their back pain to an injury that

occurred long ago that suddenly flares up again. As a result of all this, we become anxious about our backs and anxiety creates tension related pain. This is where a slow accumulation of anxiety and stress over many months, even years, can cause the arrangement of muscles, nerves, tendons and ligaments to tighten and change restricting blood and oxygen supply. Muscles deprived of oxygen can build up deposits of lactic acid, triggering pain, spasm, tingling or numbness back problem.

Back pain can also be the result of some everyday activity or poor posture. Examples include:

- Pushing or pulling something.
- Carrying or lifting something.
- Bending awkwardly.
- Standing for long periods.
- Bending down for long periods.
- Twisting.
- Coughing.
- Over stretching.
- Sitting in a hunched position for long periods (eg. when driving.)
- Long driving sessions without a break (even when not hunched) e.t.c.

The experience of pain is shaped by a host of psychological factors. Choosing to attend to a noxious stimulus and interpreting it as painful are examples of 2 factors involving normal psychological processes. To be sure, pain is a subjective experience, and although it is certainly related to physiological processes, how individuals react to a new episode of pain is shaped and influenced by previous experience. Indeed, without learning from experience, it would be difficult to cope with pain and maintain good health. Thus, these psychological processes have tremendous value for survival. Yet, psychological factors are not completely understood, and the translation of their use to the clinic remains a challenge.

Applying psychological knowledge the clinical practice of physical therapy, however, has been quite a challenge. A majority of physical therapists are aware of the importance of psychological factors and attempt to utilize this awareness in their practice (Overmeer, 2004). The application of psychological knowledge in physical therapy might range from providing reassurance to setting goals or inquiring about the functional consequences of pain. However, there is an apparent lack of knowledge and tools to adequately apply this knowledge. For example, although 63% of physical therapists in a primary care setting were aware of the importance of psychological factors, only 47% reported knowledge of utilizing them clinically (Overmeer, 2004). Furthermore, when asked to specify which psychological factors are of importance, most therapists listed some evidence based factors but also a host of non evidence-based factors. Indeed, many of the factors listed by clinicians were difficult for them to address (eg, economic, drug abuse, or marital issues) in the clinic and did not match the evidence-based factors. Thus, a key to the problem appears to be a lack of clear guidelines for applying the knowledge. We acknowledge that there is currently a lack of clear information as to how psychological factors should be utilized by physical therapists and other clinicians. A review of psychological interventions designed to prevent chronicity has shown positive effects when the psychological techniques are appropriately administered, competent application appears to be vital. In our view, an understanding of the basic psychological processes is, therefore, an essential base for competent application of psychological principles in the clinic.

### **Stress-Related Back Pain**

It is important to remember that there is a dynamic relationship between your state of mind (e.g. stress level) and your physical condition (e.g, pain). Pain can cause stress, which causes more pain, which causes more stress and so on. The more chronic this vicious cycle becomes, the more likely your emotional distress will increase. This cycle can be very difficult to break. Emotional suffering can lead to loss of sleep, inability to work as well as feeling irritable and helpless about what can be done. You may feel desperate and attempt to relieve the pain at any cost including the use of invasive medical procedures. Although invasive approaches may be beneficial for some conditions, often they can be avoided of stress and pain are managed at an early point in time. Education and reassurance from your health care provider goes a long way in preventing or relieving a great deal of stress and anxiety. You also need to be proactive about your condition and treatment. These naturally occurring feelings of anxiety and stress may cloud your judgment. Your goal is to avoid getting in a chronic back pain cycle. Reassurance from your health care provider that the pain is only temporary can go a long way to help you avoid becoming preoccupied with pain, and prevent unnecessary worry about the symptoms.

**Psychological Processes**

In this study, we provide an overview of fundamental psychological processes that are involved in most types of pain problems and highlight how these processes may contribute to the development of a persistent pain problem. A basic theme is that the psychological processes are highly intertwined and function together as a system.

There are different ways in which we might group psychological factors. In our presentation, we attempt to portray the influence of psychological factors, as a sequence of processes, starting with initial awareness of the noxious stimulus, then cognitive processing, appraisal, and interpretation that leads people to act on their pain (ie, their pain behavior). These processes are influenced by their consequences and are limited by the environment (eg, cultural and social values). Although we present this as a sequence for understanding, we are aware that this is a model, and much more work is needed to fully describe these processes. In addition to the model, **Table 1** below provides an overview of the main factors and their possible consequences for the experience of pain.

**Attention**

An obvious prerequisite for pain perception is that our attention is directed toward the noxious stimulus. In fact, one function of pain is to demand attention (Eccleston & Crombez, 2000). Viewed as a warning signal, pain is helpful because this attention should lead to appropriate responses in dealing with the injury. This view also underscores why it is difficult to simply ignore pain, particularly if it has alarming characteristics (e.g. being very intense, sharp, or unusual).

The dilemma is that we sometimes pay attention to pain when there is little we can do to alleviate it (e.g. having chronic musculoskeletal pain), but do not attend to it when it may be a useful warning signal (eg, during an accident). Although attention is under the control of some basic brain processes, its psychological function is to motivate behavior. If pain is considered a “threat”, then the threat value of the (noxious) stimulus helps to steer awareness: the greater the threat, the more attention given. Attention to pain then may be linked to fear and anxiety and the need to take action (e.g. escaping or avoiding it). Vigilance refers to an abnormal focus on possible signals of pain or injury that might help explain why a seemingly small injury results in intense pain. This mechanism also underscores the close link between emotional and cognitive processes and attention. Attentional factors are quite pertinent in the clinic because there are techniques that address them. Distraction techniques teach patients to shift their attention to stimuli other than the pain (e.g. by imagining the sounds of waves hitting the shore), whereas interceptive exposure shifts attention toward the pain so that the signal will habituate.

**Interpretation**

Once the noxious stimulus has been attended to, cognitive processes are used to interpret what they mean. This process is highly intertwined with emotional processes, and it sets the stage for behaving. How we think about a noxious stimulus' is shaped by our previous experiences, which explains why the simple directive “think about something else” often is impossible to accomplish. Indeed, the paradox is that attempting to suppress thoughts about pain actually increases the pain experience. Cognitive processes are central in explaining why we sometimes may experience an insignificant stimulus, such as light pressure, as severe pain, or a serious injury as little or no pain. Several basic cognitive and emotional aspects are involved in the interpretation of pain.

**Table 1.**  
Summary of Psychological Processes

<b>Factor</b>	<b>Description</b>	<b>Possible effect on pain and disability</b>	<b>Example of Treatment strategy</b>
Attention	Pain demands our attention.	<ul style="list-style-type: none"> <li>• Vigilance may Increase pain Intensity.</li> <li>• Distraction may decrease Its pain intensity</li> </ul>	<ul style="list-style-type: none"> <li>• Distraction techniques.</li> <li>• Intercptive exposure</li> </ul>
Cognitions	How we think about our pain may influence it.	<ul style="list-style-type: none"> <li>• Catastrophizing may Increase pain.</li> <li>• Negative thoughts and beliefs may</li> </ul>	<ul style="list-style-type: none"> <li>• Cognitive restructuring.</li> <li>• Behavioral experiments</li> </ul>

		<p>increase pain and disability.</p> <ul style="list-style-type: none"> <li>• Expectations may influence pain and disability.</li> <li>• Cognitive sets may reduce flexibility in dealing with pain and disability</li> </ul>	<p>designed, for example, to disconfirm unrealistic expectations and catastrophizing</p>
Emotions and emotion regulation	<p>These negative feelings may influence the pain as well as fuel cognitions, attention, and overt behaviors.</p>	<ul style="list-style-type: none"> <li>• Fear may increase avoidance behavior.</li> <li>• Anxiety may increase pain disability.</li> <li>• Depression' may Increase pain disability.</li> <li>• Distress, In general, fuels negative cognitions and pain disability.</li> <li>• Positive emotions might decrease pain</li> </ul>	<ul style="list-style-type: none"> <li>• Cognitive-behavioral therapy programs and disability for anxiety and depression.</li> <li>• Activation (to Increase positive emotion).</li> <li>• Relaxation.</li> <li>• Positive psychology techniques that promote well-being and positive emotions.</li> </ul>
Overt behavior	<p>What we do to cope with our pain influences our perception.</p>	<ul style="list-style-type: none"> <li>• Avoidance behavior may increase disability.</li> <li>• Unlimited activity (overactivity) may provoke pain.</li> <li>• Pain behaviors communicate pain</li> </ul>	<ul style="list-style-type: none"> <li>• Operant, graded activity training.</li> <li>• Exposure <i>in vivo</i>.</li> <li>• Coping strategies training.</li> </ul>

**Beliefs and attitudes:** We all hold certain assumptions about how pain works and what it probably means to feel a given stimulus (DeGood & Shutty, 1999). Beliefs serve the useful purpose of aiding in rapid interpretation of stimuli, and they seem to provide a shortcut that helps our brain process the enormous amount of incoming stimuli in a more efficient manner. They provide a sort of automatic interpretation of the stimuli; thus, these stimuli do not need lengthy processing in the brain. Yet, this very propensity can lead to responses that may be detrimental. Beliefs and attitudes also are influenced by the social setting we live in so that our views about what might be causing the back pain (eg, work demands) and what should be done (eg, get a radiograph) reflect a broader social representation. Several attitudes and beliefs have been found to be related to the development of persistent pain and disability (Main, Foster & Buchbinder, 2010). For example, certain beliefs that set the stage for activity restrictions are tied to the development of long-term pain and disability. These beliefs include the idea that “hurt is harm” (ie, if it hurts, something serious must be broken), that “pain is a signal to stop what you are doing” (ie, if an activity results in pain, you should stop before you injure yourself), and that “rest is the best medicine” (ie, pain is a signal you should rest to recuperate your body).

**Expectations:** The ideas or perceptions we have about our back pain also are mirrored in our expectations and may have considerable impact on our experience of the pain. Normally, we have ideas about the cause of the back pain, its management, and how long it should take for recovery. These expectations appear to drive coping behavior, even in the seeming absence of actual feedback.

Furthermore, such expectations or health perceptions are a good predictor of outcome in a host of medical conditions. One significant determinant of our experience of pain is, *whether our expectations are fulfilled*. We may expect, for instance, that we will fully recover from a bout of neck pain in 3 or 4 days. Epidemiology tells us that this is a very optimistic expectation, and when the expectation is not fulfilled, it may generate further negative cognitions and motivate behaviors that may not be particularly helpful.

**Cognitive sets:** In the process of making sense out of incoming signals, we use various “ways of thinking” to help provide a framework. This is a normal and helpful process, but for a variety of reasons, some patients may use cognitive patterns that misrepresent actual events or probable future events. The patient may fall into a cognitive trap where the interpretation is tantalizing and well connected with the emotional state, but where a consistent “error” in interpreting reality is made. This pattern of interpretation is like a lens that distorts one’s view of the world and appears to function as a part of our response to stress (Barlow, 2015). An example of such a thought process is back *pain catastrophizing*, which can be defined as an exaggerated, negative orientation toward pain where a relatively neutral event is irrationally made into a catastrophe. In essence, the person imagines the worst possible result that could happen, but accepts it as the given result.

Catastrophic thoughts usually are stated as assumptions (eg, “If the pain does not get better, I will end up in a wheelchair” or “The pain will never stop, it will only get worse and worse”). Not surprisingly, pain catastrophizing is associated with a variety of problems that hinder recovery, making treatment more difficult and increasing the risk of developing persistent back pain and disability (Nicholas, Linton & Watson, 2011). In short, because catastrophizing is a marker of the development of long-term problems, it may be an important target for treatment.

**Emotions and their regulation:** One of the most disruptive features of back pain is the emotional distress. The typical emotional reaction to back pain includes anxiety, fear, anger, guilt, frustration, and depression. How these emotions are regulated by the patient has implications for their impact on back pain. Indeed, emotions are powerful drivers of behavior and shape our experience of the back pain via direct neural connections. Negative affect is a key reason we associate back pain with suffering. Thus, back pain activates negative emotions that vary from tolerable to miserable. It is interesting, therefore, that clinicians often focus more on the sensory aspects of back pain (eg, intensity) than on the emotional aspects. Indeed, negative affect is strongly associated with poor treatment outcome, as well as the development of disability from low back pain.

Anxiety and worry are prevalent emotions, as low back pain represents an imminent threat to our welfare. People with persistent low back pain typically have significantly higher rates of anxiety disorders than do those without persistent low back pain (Salkovskis & Warwick, 2001). Fear, which is characterized by an extreme reaction that prepares us for “fight or flight”, is one form of anxiety that has powerful consequences (eg, for our cognitions, attention, and behavior). Fear, however, is time limited. More common is worry, which is distinguished by frequent cognitive intrusions where the person considers “what if” possibilities that are quite negative and aversive (Barlow, 2015). Because of this nature, worry drives behavior, attention, and cognitions.

Depressed mood is a common and powerful emotional state that affects the low back pain experience. Depression is defined as a psychological problem characterized by negative mood, hopelessness, and despair, and an average of 52% of patients with low back pain fulfill the criteria for depression (Bair, Robinson, Katon, & Kroenke, 2001). Even more people have a depressed mood but do not fulfill the diagnostic criteria for major depression (Barlow, 2015). The presence of depression in a low back pain condition is associated with higher levels of pain intensity and is a potent risk factor for disability (Bair, Robinson, Katon, & Kroenke, 2013). Furthermore, people who have musculo-skeletal pain and are depressed have, been found to have twice the sick leave duration as those who have pain but are not depressed. Future risk of long-term disability also is affected negatively, as is treatment outcome (Bair, Robinson, Katon, & Kroenke, 2013). Studies have shown that high levels of pretreatment depression are associated with poor rehabilitation outcomes (Nicholas, 2007).

**Coping Strategies:** When a painful stimulus has been attended to and interpreted as being a threat, strategies for dealing with this threat are activated (Linton, 2015). These strategies first may be activated cognitively and involve a host of cognitive techniques (eg, ignoring, visualizing) and overt behavioral techniques (eg, relaxation, self-statements) believed to reduce the threat of the pain. Coping strategies are learned and involve an integration of emotional, cognitive, and behavioral systems. The learning experiences help to fine tune these strategies by providing feedback as to whether they work or not. Although some situations offer the opportunity to ponder which strategy might be best, such as a relapse or flare-up, the choice of coping strategy may occur quickly without conscious thinking in acute situations, such as an acute injury (eg, cut your-self with a knife, smashed finger with a hammer). Once the strategy is activated, it is likely that this process will be reflected in actual behavioral attempts to cope with the pain.

### **Low Back Pain Behavior**

An important step forward in understanding the psychology of pain was taken in the 1970s when Fordyce put forth the idea that low back pain should be analyzed as behavior (Fordyce, 1976). Back pain is a private event, but it can be viewed as a set of behaviors such as taking analgesics, seeking care, or resting. Furthermore, internal events such as thoughts and emotions also are considered to be forms of behavior. Although pain is a complex experience that is difficult to understand, it basically is no more so than other psychological problems such as depression or generalized anxiety that also are conceptualized in this way. Viewing back pain as a set of behaviors renders analyses using learning paradigms. Most pain behaviors are

learned and are influenced by emotions and cognitions, but in particular via direct environmental consequences. Thus, one learns to cope with back pain by taking various actions or thinking in a certain way. When these behaviors result in less pain, this outcome may reinforce the action and make the behavior more likely with future pain episodes.

Learning factors help explain why persistent problems sometimes develop. First, a basic tenet is that behaviors providing short-term benefits (ie, pain relief) sometimes can be detrimental in the long run. For example, Fordyce (1976) suggested that although resting or taking analgesics may be a good coping strategy in the acute phase, these behaviors might actually facilitate the development of long-term problems. Consequently, treatment programs for people with chronic musculoskeletal pain problems have been built on gradually changing these behaviors, such as by decreasing analgesics and increasing activity levels. A second basic tenet is that learning involves the whole organism and environment; therefore, pain behaviors may be reinforced by social and environmental consequences. Learning then can be quite important in the development of chronic disability. For example, changes in life routines necessitated by the pain (eg, can no longer do the vacuuming) might be maintained by other consequences (eg, partner gladly does it instead).

Learning paradigms provide a tremendous opportunity for helping patients change (ie, to learn skills that allow them to cope better with the pain). If part of the suffering and disability are related to learned changes, it is possible to make further changes toward a more preferable goal by utilizing the principles of learning. This is why most multidimensional rehabilitation programs use some type of learning paradigm, usually in the form of cognitive behavioral therapy (Main, Sullivan & Watson, 2008). It also is why early interventions designed to prevent the development of persistent disability tend to focus on changing cognitions and behavior (Linton, 2002).

Taken together, these processes provide insight into how psychological factors affect the experience of low back pain. Nevertheless, it still may be difficult to appreciate how these processes work in reality and how we might utilize them in specific ways in the clinic. To facilitate understanding and application, various models have been put forward. In the next section, we examine pertinent theoretical models of back pain that have applied psychological processes to explain how back pain problems develop over time and how these models might guide clinical interventions.

### **Models of the Development of Persistent Pain Problems**

A number of theoretical models have been proposed to explain more specific ways in which psychological factors might have a bearing on back pain and disability over time. Most researchers in pain psychology subscribe to a broad, biopsychosocial formulation, but more-specific conceptual models provide a pathway whereby psychological factors affect the transition from acute to persistent pain problems. Although there are many theoretical perspectives of back pain and disability, we will present the 5 theories commonly referred to in current studies of back pain psychology. Three of these models (fear-avoidance, acceptance and commitment, and misdirected problem solving) are specific to the experience of chronic pain, and 2 of these models (stress-diathesis and self-efficacy) represent broader theories of health behavior that can be applied to back pain.

Table 2 provides a summary of the models and examples of the basic components, the processes involved, and some implications for treatment. The 5 models provide ways of understanding how the specific interactions and mechanisms, that exist between psychological factors are interrelated and interconnected. Thus, they help us to understand the development of persistent pain and disability. Moreover, each of these models highlights different mechanisms which may help us select the most effective ways to address psychological factors in the clinical management of Low Back Pain.

### **Psychological Models of Low Back Pain**

**Fear-avoidance model:** One of the most influential models to explain psychological factors in the experience of back pain has been the fear-avoidance model, which was advanced to explain how patients with an acute or sub-acute back pain condition might transition over time to a chronic state of depression, disability, and inactivity (Vlaeyen, Kole-Snijders & Boeren, 1995). A specific emotion regulation factor in the model is fear. Fear of back pain develops as a result of a cognitive interpretation of pain as threatening (pain catastrophizing), and this fear affects attention processes (hypervigilance) and leads to avoidance behaviors, followed by disability, disuse, and depression. Both negative affectivity (a tendency to see the

cup as “half empty” rather than, “half full”) and threatening types of illness information can help to fuel catastrophic thought about back pain. The fear-avoidance model suggests that in the absence of fear-avoidance beliefs about pain, individuals are more likely to confront pain problems head-on and become more engaged in active coping to improve daily function. This model is supported by the evidence that high levels of back pain related fear are associated with distraction from normal cognitive functions, hypervigilance of pain-related sensations, and unwillingness to engage in physical activities (Vlaeyen & Linton, 2002). Essentially, the fear-avoidance model purports that fear of pain and of injury or reinjury sometimes is more disabling than the pain itself (Crombez, Vlaeyen Heuts & Lysens, 1999). Overtime, fear of pain results in musculoskeletal deconditioning, reduced pain tolerance, and fewer attempts to overcome functional limitations. One practical implication of this model is that patients expressing catastrophic thoughts about pain (eg, “I can’t stand it anymore”) are at greater risk of delayed recovery (Sullivan & Bishop, 2000). These individuals may require a higher level of support and encouragement, as well as a very gradual exposure to increasing levels of physical activity. Graded exposure to physical activity has been considered a critical aspect of treatment in order to overcome a fear of back pain (Crombez, Vlaeyen Heuts & Lysens, 1999).



**Table 2.**

Summary of Psychological Models of Back Pain and Disability Highlighting the Psychological Processes Involved and Examples of Treatment Interventions

<b>Theory</b>	<b>Description</b>	<b>Psychological Processes Featured</b>	<b>Mechanism</b>	<b>Examples of Treatment Intervention Strategy</b>
Fear-avoidance model	A painful injury may result In catastrophizing and fear, which lead to avoidance of certain movements. This behavior, in turn, leads to more avoidance, dysfunction, depression, and ultimately more pain.	<ul style="list-style-type: none"> <li>• Cognitive interpretation featuring catastrophizing.</li> <li>• Emotions: fear, worry, and depression.</li> <li>• Attention: fear keys attention on Internal stimuli (hypervigilance).</li> <li>• Behavior: avoidance of movement.</li> </ul>	Activity avoidance leads to physical degeneration and social Isolation; vicious circle.	Promote physical and social activation (eg, with graded activity)
Acceptance and commitment model	Rigid beliefs (eg, that the pain must be cured) may block the pursuit of long-term life goals. Reducing futile attempts to achieve unrealistic goals (acceptance) produces flexibility and engagement in pursuing important life goals (commitment).	<ul style="list-style-type: none"> <li>• Cognitive: Flexibility In beliefs, life goals, and commitment.</li> <li>• Emotions: anger and frustration.</li> <li>• Behavior: commitment, pursuing goals.</li> </ul>	Repeated (futile) attempts to control or alleviate pain lead to frustration.	Provide realistic treatment goals and encourage client participation in decision making
Misdirected problem - solving model	Normal worry about pain may tune the patient Into certain ways of solving this problem (eg, medical cures). When this does not actually solve the problem (eg, with chronic pain or certain forms of	<ul style="list-style-type: none"> <li>• Emotions: worry as a driving force.</li> <li>• Attention: pain demands attention.</li> <li>• Cognitions: beliefs about cause of pain.</li> <li>• Behavior attempts to solve problem.</li> </ul>	Hypervigilance to pain symptoms contributes to rumination and failed attempts to escape pain; vicious circle.	Redirect problem-solving efforts toward achievement of functional goals

	musculoskeletal pain), It results In more worry and an even narrower view of the nature of the problem, making It less likely to actually solve the problem.			
Self-efficacy model	The belief that a person is capable of coping with pain is directly related to self-management; low self-efficacy, with feelings that the pain is uncontrollable cause physical and psychological dysfunction.	<ul style="list-style-type: none"> <li>• Cognitive interpretation: beliefs concerning controllability of pain.</li> <li>• Behavior coping skills.</li> </ul>	Fluctuating pain reduces perceptions of control and mastery over pain.	Encourage self care and self-management strategies, reduce dependence

Stress-diathesis model	Significant psychological stress and limited coping resources predispose a person to pain and being less prepared to deal with it. Thus, pain is more likely to result in functional difficulties and emotional distress.	<ul style="list-style-type: none"> <li>• Emotions: stress, depression, and anxiety.</li> <li>• Behavior: coping strategies and skills.</li> </ul>	Protective psychosocial factors buffer the emotional impact of pain, whereas distress and emotional dysregulation predispose to pain	Improve stress management skills and social support
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**Acceptance and commitment model:** One relatively new model for understanding psychological factors in chronic back pain is that of acceptance and commitment. This model was borrowed from a more general psychotherapeutic approach (acceptance and commitment therapy) that has been offered as a complement to cognitive-behavioral therapy (Hayes, & Wilson, 1999). At the heart of this model is a cognitive interpretation process, namely the concept of psychological inflexibility or the inability to persist in or change behavior patterns that might service long-term goals or values. The implication of this model for chronic back pain is that individuals should reduce futile attempts to avoid or control pain and focus instead on living life to the fullest, participating in valued activities, and pursuing personally relevant goals (McCracken, Vowles & Eccleston, 2004). Recent studies of patients with chronic back pain have suggested

that pain-related acceptance leads to less emotional distress and higher physical functioning (McGracken, & Eccleston, 2003). The clinical implication is that once **Low Back Pain** has persisted beyond several weeks, provider/clinician advice and treatment should communicate realistic expectations and focus more on functional adaptation and daily coping than on experimenting with new curative or palliative measures.

**Misdirected problem-solving model:** This model suggests that emotional processes in the form of worries about back pain and cognitive evaluations (eg, pain catastrophizing) are the product of a human predisposition (and probably an evolutionary advantage) to solve problems (a behavioral process) by verbally ruminating on possible negative outcomes and plotting methods of avoidance or escape. Thus, worrying about back pain and its implications is part of a natural-born problem-solving strategy, but one that, at least in the case of chronic pain, can have negative long-term consequences. This model explains why persistent back pain repeatedly interrupts attention, fuels worries about negative consequences, produces hypervigilance to back pain, and produces repeated efforts to alleviate pain, even when there is no belief that a solution exists (Eccleston & Crombez, 1999). If back pain is framed as solely a biomedical problem, problem-solving efforts inevitably will be based on strategies to remove or reduce pain. When multiple attempts to get rid of back pain fail, worries are further reinforced, and patients are stuck in an endless loop of increasing worries and failed problem-solving attempts to alleviate pain. The practical implication of this model is that repeated efforts to manage **Low Back Pain** through pharmacological, physical, and surgical (and even psychological) treatments that are focused on pain relief may inadvertently reinforce this misdirected problem-solving strategy. Instead, a reframing of the problem toward more-functional goals and away from pain relief (or biomedical explanations of pain) may help to redirect problem-solving efforts that are more likely to be successful (Eccleston & Crombez, 2007).

#### **Psychological Models of Health and Pain**

**Self-efficacy model:** Like people with other medical conditions, individuals with chronic or recurring Low Back Pain may need to adjust their habits and lifestyles while still trying to maintain basic physical, social, and vocational activities. This model requires that patients make efforts to understand the nature of their pain problem, plan self-care strategies for dealing with pain flare-ups, learn to overcome functional problems effectively, and utilize available supports and resources wisely. Thus, this model underscores behavioral processes (coping) as well as cognitive processes (interpretation of the problem and degree of control). A tenet of this model is that active coping promotes a sense of confidence, or “self-efficacy”, for dealing with pain that is associated with improved function and wellbeing (Allegrante & Marks, 2003).

*Self-efficacy* has been defined as “the belief in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997). It has been an important theoretical construct underlying research in arthritis and other sources of chronic pain. This way of thinking has contributed to the development of self-management interventions for chronic pain that focus on teaching pain coping skills, educating patients about pain, and providing social support (Foster & Taylor, 2007). Low pain self-efficacy is characterized by a feeling that pain is uncontrollable and unmanageable, given the physical demands of daily life. In terms of clinical management of **LBP**, this model suggests that provider/clinician advice and treatment should be delivered in a way that takes into account individual patient preferences, involves patients in decision making, and provides useful self-management strategies for coping with pain flare-ups and functional difficulties.

**Stress-diathesis model:** This model suggests that when LBP befalls an individual who is already under significant psychological stress or whose coping resources are already stretched thin, pain may result in more significant functional limitations and generate higher levels of emotional distress. Thus, this model highlights the role of emotional processes focusing on stress, depression, and anxiety (distress). Although this model is probably the least formally construed, there is considerable evidence that individuals with a psychiatric history, with depressed mood, with major life adversity, or reporting high levels of stress are at greater risk of transitioning to chronic and disabling LBP (Linton, 2000). Although the burden, of persistent LBP obviously, can contribute to emotional distress, it also is possible that pre-existing emotional distress (or perhaps the immediate emotional response to pain onset) might predispose some individuals to cope poorly with an episode of acute LBP. This model has been at the core of efforts to refocus LBP management on secondary prevention of distress and disability and away from the more-orthodox biomedical approach of uncovering physical abnormalities (Main, 2002). This model also has supported the recommendation that providers interview or screen patients for possible “yellow flags” if there is no immediate resolution of LBP

in the first 2 weeks after pain onset. The practical implication of this model is that more-extensive screening or history taking may be necessary to understand lifestyle, contextual, and coping factors that are important in the recovery process (Linton & Shaw, 2011).

**Implications and Guiding Principles:** Psychological theories and models about pain have provided a better understanding of cognitive, emotional, and behavioral manifestations of pain, but what is their implication for the clinical management of LBP? To summarize the most significant clinical implications, we provide 10 guiding principles in Table 3 that can be synthesized from our review above of the psychological processes, and models of the low back pain experience. Effective strategies for coping with persistent, recurrent, or chronic pain are very different from those for managing acute pain, and pain that persists beyond a few weeks can lead to emotional and behavioral consequences that are deleterious to pain recovery and functional rehabilitation. Table 3:

<b>Treatment</b>	<b>Number</b>	<b>Guiding Principles</b>	<b>Clinical Implication</b>
Assessment	1	Psychological factors that may affect pain outcomes are not routinely assessed by many treating clinicians.	Better methods of screening and early Intervention are needed to improve feasibility and utility In usual care settings.
	2	Persistent pain naturally leads to emotional and behavioral consequences for the majority of Individuals.	Psychological concepts of learning can be useful to provide empathy and support without reinforcing pain behavior.
	3	Clients who are depressed or have a history of depression may have more difficulty dealing with pain.	A brief assessment of mood symptoms should be part of routine screening and intake procedures for pain conditions.
Treatment planning	4	Persistent pain problems can lead to hypervigilance and avoidance, but simple distraction techniques are not enough to counter these behaviors.	Clinical should avoid Inadvertent messages that escape or avoidance from pain is necessary in order to preserve function.
	5	Individuals hold very different attitudes and beliefs about the origins of pain, the seriousness of pain, and how to react to pain.	Assessment and treatment planning should take into account Individual differences In pain beliefs, and attitudes
	6	Personal expectations about the course of pain recovery and treatment benefits are associated with pain outcomes.	Providing realistic expectations (positive, but frank and not overly reassuring) may be a very important aspect of treatment.
	7	Catastrophic thinking about pain is an important marker for the development of long-term pain problems as well as for poor treatment outcome.	Clinicians should listen for expression of catastrophic thoughts and offer less-exaggerated beliefs as an alternative. A brief assessment might be part of routine intake procedures.
Implementation	8	Personal acceptance and commitment to self-manage pain problems are associated with better pain outcomes.	Over attention to diagnostic details and biomedical explanations may reinforce futile searches for a cure and delay pain self management.
	9	Psychosocial aspects of the workplace may represent barriers for returning to work while pain problems linger.	Return-to-work planning should include attention to aspects of organizational support, job stress, and workplace communication.
	10	With proper Instruction and support, psychological	Psychological approaches can be Incorporated in

		interventions can Improve pain management outcomes.	conventional treatment methods, but require
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These principles provide Insight into providing a patient-centered approach, which underscores the importance of psychological responses to back pain from assessment (principles 1-3), to treatment planning (principles 4-7), and to implementation (principles 8-10).

One theme that emerges from psychological theories of pain is the need for a patient-centered approach to clinical care that takes into account individual differences in lifestyle, occupational demands, social support, health habits, personal coping skills, and other contextual factors that may dramatically affect goals and expectations for treatment. Recognizing that a patient is depressed, frustrated by persisting pain, or beginning to severely limit movements and activity are reasons to adopt a more psychological or multidisciplinary approach that might offset some of the negative functional and social consequences of a developing chronic pain problem. Among patients with persistent pain, even good problem solvers can become frustrated by repeated (futile) attempts to discover and eliminate the anatomical source of pain. Thus, once medical “red flags”, have been ruled out, conducting additional diagnostic tests or searching for a specific biomechanical explanation of LBP may actually cause harm, as it can reinforce a patient's misdirected problem-solving efforts to find a cure for pain, rather than to begin solving the functional problems associated with pain.

Another theme that emerges from psychological theories of pain is importance of emotional responses and pain beliefs. Individuals shows tremendous differences in their ability to regulate emotions as well as their attributions about pain, their judgments about the seriousness of pain, their expectations of assistance and emotional support from others, and their sense of control and mastery over pain. Three pain beliefs that have been shown to put patients at greatest risk of a poor prognosis are pain catastrophizing (an exaggerated, negative interpretation of pain), fear avoidance (a belief that all activity should be avoided to reduce pain), and poor expectations for recovery. Assessing these patient beliefs about pain may be even more important than reaching a definitive diagnosis or explaining what set of factors actually contributed to pain onset.

Providing psychologically oriented treatment techniques or simply utilizing psychological principles involves the application of the basic processes and models presented in this paper. There is a growing need to translate these ideas into useful clinical tools and interventions for widespread dissemination. Psychological interventions range from simple techniques, involving communication skills to advanced methods requiring considerable training and practice under supervision. Thus, although we encourage application, we also believe that professional competency is warranted. Assessing psychological factors in patients with LBP is a critical first step, and successfully utilizing them in treatment may be a key to improving outcomes and preventing the development of chronic disability.

### **Summary Assessment**

Pain is a subjectively-experienced event brought about by the dynamic interaction of biological, psychological, social and also personal variables that may contribute to it. This includes cognitive, affective and behavioural factors which the individual brings into the situation.

Human beings try to make sense of their experiences. They search for information, they generate inferences about personal and environmental events and they develop schemas around which they organize their experiences. Beliefs about low back pain and its significance, conceptualizations about its causes, appraisals about one's ability to manage the discomfort and errors in processing information (self-defeating styles of thinking) can all affect one's experience of low back pain. Chronic pain patients who tend to catastrophize, or who show pessimistic styles of thinking, for example, are likely to show higher levels of physical and emotional distress than those individuals who show less self-defeating styles of thinking (Vigna, 2015). It is well-recognized that with the failure of medical/physical interventions to relieve pain and associated limitations following an injury, pain sufferers can become anxious, or worried about their pain and that with continued suffering, they may well develop a sense of helplessness and become depressed.

Sympathetic nervous system arousal associated with high levels of anxiety leads to increased muscle tension and thus, to an increase in discomfort, through a pain-tension-pain cycle. It is likely also to lead to disrupted sleep, and, thus, to a disruption in restorative mechanisms which may then make a chronic pain sufferer's day much more challenging. Chronic pain sufferers who are also clinically depressed tend to report higher levels of pain intensity and higher interference with life activities and life satisfaction as a result of pain, relative to those sufferers who are not depressed.

From a behavioural stand point, clinical psychologists assess the presence of low back pain behaviours and of passive or avoidance strategies associated with pain. Operant conditioning models suggest that pain behaviours can be reinforced by the social environment and are, thus, more likely to recur. They are also likely to recur if they lead to the avoidance or elimination of some aversive circumstance in the life of the patient. Pain behaviours can result in a variety of consequences. They can lead to an increase in attention or sympathy from others, but they can also lead to others moving away from the sufferer. It is not common for chronic pain sufferers to develop avoidance strategies in managing their pain. They do so, in part, to avoid an increase in discomfort.

Cognitive-behavioural therapy (CBT), based on the assumption that if chronic pain sufferers can develop appropriate coping strategies they can alter their experience of pain, has assumed a prominent role in the management of low back pain. CBT focuses on the physical sensations of pain, as well as on the cognitive, affective and behavioral factors that may maintain or affect its presence. It assists sufferers in the development of strategies that facilitate more of a sense of control over their experiences and lower the sense of helplessness and general emotional distress. Included in cognitive-behaviour low back pain management programmes are:

- education in the dynamic interaction among physical, cognitive, affective and behavioural variables.
- the teaching of specific strategies with which to monitor and modify one's physical and emotional distress.
- relaxation training components that allow individual to gain a sense of awareness over physiological states and to achieve a sense of physical and mental relaxation.
- cognitive restructuring approaches that facilitate the elimination of self-defeating patterns if thinking and the development of more adaptive ones.
- anxiety and depression management techniques focus on pain behaviour.
- self-monitoring and pacing components.
- structured daily plans to ensure the presence of pleasant experiences during the day.
- assertion training to facilitate productive interaction with treatment personnel and with significant others.

Psychological therapy-based programmes of this nature are not suited to those individuals whose goal is the elimination of pain, but they can be quite helpful to learn to manage their discomfort and to live productive and rewarding lives in spite of the presence of low back pain.

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