

## Behavioral Management of Pain: A Case Report

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### ABSTRACT

Pain results from complex interplay of biological, psychological & sociocultural factors. There are gamuts of medical and psychosocial factors which cause pain. The advent of technology and inordinate and improper use of computers and its components like key board and mouse are also associated with pain. It has been found both on the basis of research and clinically that software professionals often consult physicians for pain in different site of their body more specifically fingers, upper limbs, neck and forehead. This medical condition is known as Repetitive Strain Injury (RSI). It might result because of repetitive tasks, mechanical compressions or sustained or awkward positions. The patients of this medical condition often experience inflammation at different sites of body parts which are often involved in using computers. Unhealthy bodily postures are also associated with an issue. Pain is basically a sensory, emotional and subjective experience. High psychological arousal and cognitive set are significant factors which maintain or exacerbate the pain. In this paper, Behavioral management of pain specifically refers to brief cognitive, behavioral and mindfulness based psychological interventions in pain management. The current paper focuses on psychological factors related to pain and presented a case with RSI in holistic pain management and highlights the importance of incorporating biopsychosocial model in pain management for speedy recovery and better quality of life of patient.

*Keywords: RSI, Pain, Biopsychosocial Model*

**P**ain is a complex, personal, subjective and unpleasant sensory and perceptual experience that may or may not have any correlation with bodily injury or tissue damage. The International Association for the study of pain defines pain as “Sensory and emotional experience” (IASP, 1979). Emotional processes are central to the experience and expression of pain. Pain is the outcome of a complex interplay of influences, including psychological factors, which may operate both as risk factors in and consequences of pain. Psychological factors play an important role in the onset, severity, exacerbation or maintenance of the pain. During the past half century, psychological thought has moved away from linear to multicausal models of pain (Gamsa,

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1994). When a psychological causation of pain is postulated, multiple determinants of pain are usually also discussed. In this paper, behavioral management of pain refers to three psychological approaches (Cognitive behavioral approach, relaxation approach and mindfulness meditation) for the pain being used with the case being describe in the paper.

Cognitive and emotional factors are involved, fear, anxiety, attributions, beliefs, self-efficacy, sense of having control over pain, and coping strategies interact in complex ways in the development of the problem of pain. Signs of emotional distress are frequently the most clearly recognizable evidence that another person is experiencing pain. The most common emotional concomitants of pain are anxiety, fear and depression. Pain also involves gamut of emotional states like anger aggression and guilt. Pain also creates fear of avoidance whereby anxiety about activities exacerbating the pain stimulates the avoidance of those activities. Activity patterns and daily routines become disrupted while depression and catastrophizing thoughts are obstacles to recovery. Pain behaviors like groaning, crying etc. are reinforced by the social response they bring (attention, sympathy, legitimization of the behavior, and a temporary reduction of pain). Passive behaviors such as resting, reading, or watching television, which may be pleasant and associated with less pain, may become predominant. Pain behaviors may also buy time out of undesirable duties or activities.

### ***Biopsychosocial Model of Pain***

Engel (1977) gave ‘Biopsychosocial’ approach to medicine. The biopsychosocial model presumes some form of physical pathology or at least physical changes in the muscles, joints, or nerves that generate nonoceptive input to the brain. At the periphery, nonoceptive factors transmit sensation that may or may not be interpreted as pain. Such sensation is not yet considered pain until subjected to higher order psychological and mental processing that involve perception, appraisal and behavior. Perception involves the interpretation of nonoceptive input and identifies the type of pain (sharp, burning). Appraisal involves the meaning that is attributed to the pain and influences subsequent behaviors. The biopsychsocial model has been instrumental in the development of cognitive behavioral treatment approaches for chronic pain, including assessment and intervention.

Pain is ultimately a subjective, private experience which is invariably described in terms of sensory and affective properties. The affective components of pain include negative emotions especially depression, anxiety and anger.

### ***Depression and Pain***

Studies suggest that 40-50% of chronic pain clients suffer from significant depression (Banks and Kerns, 1996). Turks (1995) determined that individual’s appraisal of the effects of pain on their lines and of their ability to exert control over the pain and their lives mediated the pain-depression relationship. These clients who believed that they could continue to function and maintain control despite their pain did not become depressed.

### *Cognitive Factors and Pain*

Cognition refers to beliefs, attitude, perception, knowledge and appraisal of any phenomenon. The term appraisal has come from the psychology of emotion. Appraisal means one's interpretation and understanding of a particular situation or one's own somatic/bodily processes. Cognitive factors are determined by one's indirect or direct experiences. Cognitions are either directly or indirectly related to pain perception. They either precipitate or maintain or exacerbate pain. Cognitive behavioral interventions for pain management work on modifying dysfunctional beliefs related to pain and help building effective coping skills and through healthy coping statements.

### *Chronic Pain and Cognitive Behavioral Interventions*

Many medical conditions like osteoarthritis, pain associated with oncology issues, fibromyalgia and gamut of medical conditions lead to chronic pain in the patients. Chronic pain is not only one of the highly prevalent problem but also a costly issue for people suffering from it, health care system and society in general. Patients with chronic pain report impairments of multiple quality-of-life measures, including physical, social and psychological well-being. This mixture of physical, emotional and social factors often complicates managing patients with chronic pain. Treatment of chronic pain needs to address the physical pathology that initiated the chronic pain, as well as the important social and psychological sequelae of chronic symptoms. Although multiple medical, surgical and other physical interventions are available, patients with chronic pain continue to experience symptoms with significant distress and disability. As a consequence, patients experience frustration, emotional distress, feelings of helplessness, and an overall sense of demoralization as they continue their quest to achieve relief. Psychological treatments are often considered when medical interventions prove to be inadequate but often are not integrated with traditional medical approaches. Psychological approaches used alone or in combination with appropriate pharmacological strategies, should be an integral part of care plans for most chronic pain patients. Psychological interventions used in combination with appropriate drug regimen often improve overall pain management, enhancing therapeutic effects while allowing reduction of medication doses to prevent or diminish adverse drug effects. Based on empirical research, there are three most common types of psychological treatment of chronic pain include:

1. Cognitive Behavioral Therapy (CBT),
2. Relaxation Training, and
3. Mindfulness meditation

These approaches are often used together to provide simultaneous interventions at cognitive and physical levels. Research on cognitive behavioral interventions in chronic pain involves CBT, relaxation therapy, biofeedback, or some combination of the three. Generally, some form of CBT is combined with either relaxation training or biofeedback.

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### ***Assessment***

Patients with chronic pain need to feel understood by those who are providing care to them. On the other hand, a therapist requires relevant and adequate information about the patient from a bio-psychosocial perspective to establish therapeutic goals. Therefore, a comprehensive psychological assessment is a prerequisite for CBT and other interventions. Before starting the therapy clinician should have understanding of the following:

1. The patient in his or her physical and social environment,
2. The patient's relevant strengths and weaknesses,
3. The evidence for any psychopathology,
4. The nature of the disease and treatment regimen, and
5. The coping skills being used by the patient,

Furthermore, a comprehensive Behavioral Analysis with reference to cognitive behavioral model of chronic pain will help in formulating specific goals and targets for behavioral change for a patient.

### ***Cognitive Behavioral Therapy***

CBT uses active, structured techniques aimed at modifying thoughts and behaviors and assisting individuals in developing a perspective of personal control and self-management of their pain.

The components of CBT include

- Reconceptualization of the pain experience as subject to personal control
- Identification of idiosyncratic beliefs about pain and pain treatment; through the influence of thoughts, feelings, and physical activities
- Training in a number of cognitive and behavioral coping skills and presentation and discussion of their rationale
- Practice and consolidation of these coping skills through imagery, rehearsal, role playing, and contingent reinforcement of their appropriate use.

### ***Patient Education and Preparation for the Cognitive Behavioral Therapy***

The importance of patient education cannot be overemphasized. Such education programs commonly include information about the nature of pain and how to use pain assessment instruments, medications, and non-pharmacological pain management strategies. For many patients, especially older persons, family caregiver education is also essential. Whether the program is conducted one-on-one or organized in groups, it should be tailored to patients' needs and levels of understanding. The use of suitable written materials and appropriate methods for reinforcement is important to the success of the program.

Introducing the cognitive behavioral model into treatment requires some preparation of the patient. Preparing the patient for CBT involves reconceptualization of pain experience and establishing a collaborative therapeutic relationship. It can begin with dispelling the myth or misconception that the patient has been referred to a mental health professional because the pain

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is “in your head”. One must always be careful not to imply that “the pain is all in our head” or not believable. It is helpful to present therapeutic techniques as methods to help the person manage the pain more effectively, improve the quality of life, and improve one’s mood even though the pain will still be there. Patients with chronic pain need to understand and accept that one of the main aims of CBT is to enable them to develop more effective coping strategies.

Explaining and discussing the gate control theory of pain with the chronic pain model along with examples form the foundation upon which the multifaceted intervention will be justified to the patient. Patients can be encouraged to explore links between cognitive behavioural factors and their pain. Active participation of patient in therapeutic program is essential for its success. It is helpful to explain that psychological pain management techniques differ from the many medical treatments the patient has likely undergone. In contrast to medical treatments, the patient must be actively involved in cognitive behavioural intervention program. Giving the rationale behind the various interventions (e.g., cognitive behavioral strategies, relaxation training, etc) to the patient also helps in the promotion of reconceptualization of pain experience as well as in his or her active involvement in the therapy.

### ***Cognitive Restructuring***

The cognitive behavior therapist and patient work together to identify specific patterns of thinking and behavior that underpin the patient’s difficulties. Treatment continues between sessions with homework assignments both to monitor and challenge specific thinking patterns and to implement behavioral change. The cognitive methods in therapy include:

- Detailed explanation and discussion of the cognitive model to develop understanding about connections between thoughts, affect, and behavior using ABCDE paradigm
- Keeping a diary monitoring situations, thoughts, and feelings to develop awareness about these (Box 1).
- Identifying connections between thoughts, affect, and behavior
- Identifying specific cognitive errors or distortions
- Examining evidence “for” and “against” the thoughts
- Coaching patients in challenging negative thoughts by questions and other rational techniques
- Learning to identify dysfunctional assumptions underpinning distortions
- Cognitive rehearsal of coping with difficult situations or use of imagery

### ***Box 1: Thought Diary Date :***

<b><i>Time Situation</i></b>	<b><i>Emotion or Feelings or mood (Rate degree, 0-100%)</i></b>	<b><i>Automatic Thoughts (Rate belief, 0-100%)</i></b>	<b><i>Alternative Responses (Thoughts) (Rate belief, 0-100%)</i></b>	<b><i>(Re-rate belief in automatic thought (0-100%) &amp; emotion (0-100%)</i></b>

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**Challenging Dysfunctional Automatic Thoughts:** Following key questions can be utilized to challenge dysfunctional or negative automatic thoughts identified:

- Is there an alternative explanation?
- What is the evidence that this thought is true ?
- What are the advantages and disadvantages of thinking this way?
- What is the best outcome, worst outcome, and most realistic outcome?
- What is the likelihood that this will happen?
- Am I asking questions that have no answer?

Patients are helped to learn application of these key questions to their own negative thoughts whenever they occur. They can select one or two questions that are useful in identifying the underlying logical problems in their thinking.

### ***Reducing Catastrophizing and Promoting Appropriate Coping Strategies***

Catastrophizing is one of the most common cognitive errors observed in chronic pain patients; therefore, it should be identified and specifically targeted. Catastrophizing patients are more likely to improve from self-instruction and verbal re-attribution, whereas non-catastrophisers benefit from interventions such as attention switching or distraction or attention control training (mindfulness). To reduce Catastrophizing, clinician should encourage the patient to recognize catastrophic cognitions and appreciate the unhelpful nature of these in coping with chronic pain as well as help them to develop alternative ways of thinking about it.

Generally, patients develop their own coping strategies to deal with their pain. The aim of coping strategy enhancement is to facilitate the implementation of appropriate active coping strategies, at the same time reducing the passive ways of coping. Before introducing new coping strategies, effectiveness of existing coping strategies should be analyzed. Use of particular strategies is often associated with patient's pain representations and pain control. If a patient believes that pills can alleviate pain, he may overuse medication and underuse the strategies related to psychosocial factors. Training in cognitively based coping strategies increases coping attempts, decreased negative thinking and lower tendency to report pain. Patients can test out which strategies are most effective for them. Coping strategy intervention can be targeted at medication use if there is evidence that medication is being used erratically or contrary to medical advice.

### ***Relaxation Training***

Relaxation is defined several ways; as a psychophysiological state characterized by parasympathetic dominance of multiple visceral and somatic systems; the absence of physical, mental, and emotional tension; the opposite of Cannon's fight-or-flight response. Relaxation is a learned skill with the potential to offset the negative effects of physical and psychological stress and rebalance the body, mind, and spirit. This technique has been observed to assist the individual to respond to life's challenges in more healthy ways, bringing involuntary responses such as heart rate, blood pressure, respiration, blood flow to muscles, muscle tension, and

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adrenalin secretion under voluntary control. Relaxation states allow the individual the opportunity to experience an inward focus of attention, an awareness of an altered perception of time and place, control of personal state of awareness, and a relaxed inner calmness or sense of a sacred healing space.

### Relaxation Procedures

#### *Jacobson's Progressive Muscles Relaxation (JPMR):*

JPMR is performed by first tensing, and then relaxing, the muscles of the body, one group at a time. Muscle groups can be divided a number of different ways, but a common method is to use the following groupings:

- Hands and arms
- head, neck, and shoulders;
- trunk, including chest, stomach and back;
- thighs, buttocks, legs, and feet.

The patient lays or sits in a comfortable position, and then starts with the first muscle group, focusing on the feeling of the muscles and the absence or presence of tension.

***Release-only Relaxation:*** Like progressive relaxation, release-only relaxation focuses on relieving feelings of tension in the muscles. However, it eliminates the initial use of muscle tensing as practiced in progressive relaxation, focusing instead solely on muscle relaxation. Release-only relaxation is usually recommended as the next step in relaxation therapy after progressive relaxation has been mastered.

***Mindfulness Meditation:*** It refers to a family of techniques which have in common a conscious attempt to focus attention in a non-analytical way and an attempt not to dwell on discursive, ruminating thought. Such exercises vary widely and can involve sitting still and counting breaths, attending to a repeated thought, or focusing on virtually any simple external or internal stimulus. Vipassana or mindfulness meditation or therapeutic approaches based on it have received considerable attention in last two decades. In mindfulness meditation a 'choiceless' and non-judgmental awareness is achieved through practice of various kinds of procedures. The focus is to make both the mind and body relaxed. Clients are asked to pay attention to the incoming and outgoing breath, their thoughts, feelings and sensations. They are asked to be non-judgmental about their thoughts and experience bodily sensations and feelings and all kinds of mental events as they occur naturally without any kind of regulation. Mindfulness meditation has been found to be very useful in patients with chronic pain.

## **METHODOLOGY**

Single case design was used in the current clinical work. Beck Depression Inventory (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) was used to assess depression. Beck Depression Inventory (BDI) is a 21-item, self-report rating inventory that measures characteristic attitudes

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and symptoms of depression. It is highly reliable and internal consistency ranges from 0.73 to 0.92 (Beck et al, 1988). Scores for each item range from 0 to 3; the total score is the sum of all responses.

### ***Procedure***

When the patient contacted the author, he was informed about various clinical and research issues like confidentiality of his responses, his anonymity will be maintained, psychoeducation about his medical condition, rationale of psychological assessment and the reasons of following a specific intervention, probable number of sessions and their frequency in a week, therapy related issues like fees, timing, set up where therapy will take place, duration of each session, issues related to postponement of session were discussed before the clinical work. Written informed consent was taken from him.

### ***Case Illustration***

A.P, 35 year old married Hindu male, studied upto B.Tech currently working as software engineer in a private company hails from Bangalore presented with chief complaints of low back pain, pain in fingers while using mouse, pain in neck, irritable mood, disturbed sleep and decrease interest and efficiency in work for the last 8-9 months with acute onset and progressive course with nil significant personal, past medical and psychiatry history. Treatment history revealed on and off using pain killers to wind off the pain. Premorbidly the patient was having overall optimal functioning. MSE revealed sad mood and the diagnosis of Repetitive Strain Injury (RSI) was made.

Beck Depression Inventory (BDI) was administered to evaluate symptoms of depression, its severity and to decide plan of management. The patient obtained a score of 13 on BDI and clinical interview and clinical judgment also ruled out depression.

The holistic management plan was formulated with different rehabilitation professionals besides clinical psychology interventions. The referral to physiotherapists was made to work on gross motor and dealing with ergonomic issues while referral to occupational therapists was made to work on fine motor issues.

### ***Brief Summary of Sessions***

The patient was referred to a clinical psychologist for pain management and management of other psychological issues if present in the patient. Total of *10 sessions* were conducted with the patient with approximately one hour duration twice a week on outpatient basis. In the first session, *working alliance* was developed with the patient and the idea of *collaborative work* was emphasized. *Confidentiality* and other therapy related issues were discussed. *Psychological assessment* was also planned for the next session to help understanding the patient's mood in terms of sadness. In the *second session*, *BDI* was administered and subsequent feedback was given to him in the same session. The third session was focused on *brief education of pain* and



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the interventions planned for reducing pain issues of the patient. The *fourth and fifth sessions* were focused on *Mindfulness intervention*. He was trained in practicing Mindfulness to work on pain issues. He was asked to use the technique approximately 20 minutes daily and even in day to day practice while doing different tasks. Self monitoring of pain through pain diary in terms of pain eliciting situations/thoughts, severity of pain, its frequency, duration and what the patient does to minimize the patient was done. The patient was also asked to keep monitoring “Painless /absent time”. In the subsequent *two sessions* ( *6<sup>th</sup> & 7<sup>th</sup>*), *relaxation training* was also given to him through *Jacobson Progressive Muscular Relaxation ( JPMR)* and *Applied Relaxation (release only)* procedures and to practice them at home along with Mindfulness practice. In the process of teaching these skills, feedback was continuously taken from him regarding his understanding of the techniques and their effectiveness. In the next *two sessions* (*8<sup>th</sup> and 9<sup>th</sup>*), the patient was trained in some components of cognitive behavioral interventions in the form of *Coping-Self statements*. The patient was trained in using effective coping statements in place of maladaptive coping statements. He was asked to use statements like

“I can control my pain to the extent possible” ( Instead of” I can’t control my pain”)

“I have pain but still I am able to work as much as I can” (Instead of “I can’t work at all because of my pain”).

In the last and *10<sup>th</sup> session*, overall *clinical evaluation* of the patient was done in terms of pain reduction. He was asked to practice *Mindfulness, JPMR* and *applied relaxation* in the presence of the therapist. The patient reported *50-55% improvement* in his pain symptoms after the 10 sessions were over. There were some doubts which were clarified in that session. The patient was sensitized not to stop other professionals’ interventions unless asked by them. Brief discussion on the importance of using the techniques at home, *relapse prevention, and follow up session* was done.

## **DISCUSSION & CONCLUSION**

CBT, relaxation training and mindfulness meditation has proven to be effective in reducing pain and disability when it is used as part of a therapeutic strategy for chronic pain. CBT addresses the psychological component of pain, including attitudes and feelings, coping skills, and a sense of control over one's condition. It can provide educational information and diffuse feelings of fear and helplessness. It can help a patient look at ways in which their attitudes contribute to inaccurate and unrealistic expectations, and can help them find a more realistic and balanced view of the problem. Relaxation approaches and biofeedback can help people in chronic pain lower their overall level of arousal, decrease muscle tension, control distress, and decrease pain, depression and disability. There is a strong need to incorporate biopsychosocial paradigm in clinical practice to further improve patient care and his/her quality of life.

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