Management of fibromyalgia syndrome

Cognitive-behavioral therapy (CBT) for healthcare professionals

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ABSTRACT

Fibromyalgia syndrome is a chronic pain condition that affects 440,000 Canadians above the age of 12. People with fibromyalgia report lifelong biological, emotional, cognitive and social complications. Recent clinical practice guidelines indicate management of symptoms is limited outside of analgesics. Cognitive-behavioral therapy (CBT) is one emerging treatment that displays promise for these individuals. CBT helps individuals to realize their maladaptive thought processes and how these can affect their own emotional response as well as the significance they attribute to potentially noxious stimuli. In conjunction with a physical exercise program, CBT shows promise in both the management of pain, and an improvement of quality of life.

INTRODUCTION

Pain, and management of pain, is complex and multifaceted.¹ Chronic musculoskeletal pain is described as persistent or recurrent pain experienced regularly for a period of 3 to 6 months, affecting specific or widespread regions of the body.² Fibromyalgia syndrome (FMS), a controversial chronic pain condition, is classified as a rheumatologic disorder that is characterized by generalized somatic pain.³ Fibromyalgia syndrome affects approximately 440,000 Canadians above the age of 12, which is 1.5% of household populations.⁴ Fibromyalgia syndrome is most commonly reported in females aged 40 years and older.^{4,5} Costs associated with FMS are extremely high with 75% of those costs being attributed to lost productivity.⁵

People with FMS report lifelong biological, emotional, cognitive, and social complications.⁴ Management of the somatic symptoms of FMS historically involved a myriad of therapies such as opioids, exercise, nerve blocks, and physiotherapy.¹ During the acute stages of pain, analgesics vary in effectiveness in eliminating symptoms. In the chronic stages, however, treatments tend to focus on management, rather than elimination of symptoms, and seek to enhance overall quality of life.⁶ As such, management goals focus on an improvement in health-related quality of life, maintenance of function, and a reduction of major symptoms.⁵ Cognitive-behavioral therapy (CBT) is often used to help individuals manage their FMS-related pain, as a way of improving mood, and fostering healthy coping skills.³

This paper aims to educate readers on the pathophysiology of FMS and the basics of CBT – an evidence-based management therapy. Although the spectrum of CBT has broadened considerably since its inception, current strategies including mindfulness-based

cognitive therapy (MBCT), dialectical behavior therapy (DBT) and acceptance and commitment therapy (ACT), arguably belong to the same family and are seen as extensions of traditional CBT.⁷⁻⁹ As an introduction to CBT in practice, we will describe the foundational principles of CBT in the context of FMS in adults, provide a summary figure for reference, and discuss implications for practice.

PATHOPHYSIOLOGY

While the underlying cause has yet to be fully elucidated, many factors have been identified in the development of FMS including genetic, environmental, and psychological factors.¹⁰⁻¹² The generalized somatic pain is sometimes referred to as central sensitization, a dysregulation in nociceptive signaling within the central nervous system.¹⁰⁻¹² With respect to heritability, FMS has a strong familial component. First order relatives of individuals with FMS are 8.5 times more likely to have the disease.^{10,13} In terms of specific genetic targets, it has been demonstrated that genes responsible for normal regulation of nociception can be down-regulated, which leads to hypersensitivity to pain.¹¹ Specific polymorphisms of serotonin transporters (5-HTT) can cause lower serum levels of serotonin resulting in higher pain sensitivities.^{11,14}

Development of FMS has also been linked to a number of environmental and psychosocial factors. Acute trauma or illness has been linked to the onset of the disease process.^{10,12} Psychological stressors such as low social support^{12,15} or early childhood trauma^{10,16} have been shown to be strong predictors of widespread pain development. Psychological factors play a large role in the triggering and persistence of FMS.¹⁷ In combination with a genetic predisposition, both environmental and psychosocial factors can trigger an abnormal amount of physiological stress,¹⁰ resulting in a dysregulation of a hypersensitive system. Thus, psychological therapies may aid in reducing anxiety-related symptoms of FMS and improving overall function.¹⁷

THE PRINCIPLES OF TRADITIONAL CBT

Cognitive-behavioral therapy was first introduced as a psychotherapeutic approach for depression in the early 1960s by Dr Aaron Beck.^{18,19} Since then, CBT has been implemented in the treatment of many different chronic pathologies often associated with anxiety or depression.²⁰ Based on an information-processing model, CBT operates under the principle that any stimulus (external or internal) is subject to personal bias. These biases can distort an individual's perception of a particular experience, leading to "cognitive errors" (eg, overgeneralizing, taking specific details out of context, or assigning personal significance to a situation).^{19,20} These errors are often the result of "dysfunctional beliefs" that

become incorporated into long-term cognitive patterns. Once triggered by external events or stimuli, these patterns can produce extreme thought processes or behaviors often seen in pathological conditions.²⁰ The following formula may help to conceptualize the primary principle behind CBT²¹:

Situation (event, stimuli) + Beliefs (core beliefs, attitudes, assumptions, automatic thoughts) = Reaction (emotional reaction and behavioral consequences)

Cognitive-behavioral therapy is often implemented in a clinical setting via 3 distinct strategies: cognitive, behavioral, and situational.²² These strategies often overlap when put into practice. A brief summary is provided in Figure 1.^{4,5,10,12,23-33} The examples provided in the figure have been shown to be effective in treating FMS and often incorporate multiple CBT strategies. Since there is no standardized definition of what constitutes a formal CBT treatment¹⁷, we have categorized each of the examples according to the definition outlined by Beck. Generally, these approaches focus on normalizing one's behavior and thought processes to produce more adaptive and realistic reactions to a given situation or stimuli.^{21,22} Based on the multidimensional nature of these strategies, it becomes apparent that an interdisciplinary approach is often required to modify cognitive processes and behaviors.

STUDIES USING CBT TO MANAGE FMS

In 2002, Turk introduced a diathesis-stress model of chronic pain which provided a more comprehensive understanding of complex pain conditions.³⁴ He proposes that it is one's pre-existing sensitivity to anxiety in combination with trauma (actual or perceived) that eventually leads to disability.³⁴ Turk describes "sensitivity" as a combination of dimensions including fear of pain, catastrophizing (ie, a tendency to envision worst-case scenarios), and causal attribution (ie, assigning personal significance to an event). Depending on a person's attitude and environment, these factors may result in a perpetual avoidance of anything that may cause pain.³⁴ With an emphasis on addressing cognitive and behavioral processes, CBT can be used to address these core elements of disability as outlined by the diathesis-stress model.

Four clinical practice guidelines have been produced to address the screening, diagnosis, management, and monitoring of FMS.^{3,35-37} The European League Against Rheumatism clinical practice guidelines (2017) recommends CBT as a nonpharmacological therapy for individuals with poor coping skills, and mood disorders.³ There is no universal definition of CBT.¹⁷ For this reason, traditional CBT, mindfulness, operant therapy, and self-management education have been considered cognitive-behavioral therapies in FMS studies. A 2017 meta-analysis of 29 randomized controlled trials (N=2509) concluded CBT is tolerable, and effective in both the short and long term for reducing symptoms and disability of FMS.¹⁷ Specifically noted is a $\geq 50\%$ pain relief (RD 0.05 [95% CI 0.02 to 0.07]), health-related quality of life $\geq 20\%$ (RD 0.13 [95% CI 0.00 to 0.26]), reduction in negative mood (SMD -0.43 [95%

CI -0.62 to -0.24]), improvement in disability (SMD -0.30 [95% CI -0.52 to -0.08]), and a reduction in fatigue (SMD -0.27 [95% CI -0.50 to -0.03]).

A combination approach using CBT and physical exercise is thought to be especially beneficial for management of FMS.³⁸ Although physical exercises may prove painful for those with fibromyalgia or other chronic pain disorders, clinicians often described that CBT therapies may help reduce the pain experience.³⁸ It has been shown that positive treatment outcomes can be generated via a combination of CBT and exercise when tailored to an individual's pain presentation (pain-avoidance, beliefs, thought processes etc.). CBT complements exercise by allowing individuals to more fully participate through improved coping skills.³⁹ In addition, CBT facilitates long-term adaptations for individuals in an exercise program by setting goals centered on activities of daily living and increasing physical activity regardless of symptoms.³⁸

One issue with the implementation of CBT in a clinical setting is that it has been employed in a variety of different formats, thus creating uncertainty for clinicians in choosing which applications to implement. Traditionally, CBT treatments have encompassed a wide range of techniques ranging from problem solving to self-monitoring. That being said, the fact that CBT follows basic principles allows for both a flexible and pragmatic adoption of a variety of interventions.²¹ Through identification of noxious stimuli and maladaptive beliefs that may cause a negative emotional reaction, clinicians can select what type of therapy may prove most effective.²² For example, if an individual's response seems to be more influenced by maladaptive beliefs, a cognitive strategy may be the most appropriate selection. Conversely, situational strategies may prove most effective if an individual's negative behavioral response is triggered by a specific stimulus. Behavioral strategies may be employed throughout an intervention such that individuals have the appropriate tools to monitor their own emotional state. By its very nature, CBT allows for a multi-faceted strategy in dealing with the consequences of FMS through a combination of cognitive, behavioral, and emotional approaches.³⁸

CONCLUSION AND IMPLICATIONS

Fibromyalgia syndrome is a rheumatic disorder characterized by chronic pain. People with FMS suffer from physical, psychological, and social complications. While pharmacological management is available, a psychological strategy, CBT, is an effective and tolerable alternative, or combination therapy choice. Healthcare professionals can apply three strategies to help patients manage FMS: cognitive, behavioral, and situational. These strategies are suited to the clinical setting as they allow for flexibility in application and provide an individualized approach. Cognitive-behavioral therapy is a viable and effective management strategy for people with FMS.

Management of Fibromyalgia:

Cognitive-Behavioral Therapies (CBT) for healthcare professionals

Table 1: Clinical implementation of CBT

Cognitive factors		
Cognitive therapy	Client and therapist collaborate to identify errors in thinking, objectively evaluate the facts, and create more realistic alternatives.	Cognitive restructuring ²³ , pain diary ¹⁰ , pain education. ²⁴
Self-Instruction training	Modification of internal dialogue to include more coping and action-oriented statements. Clients are taught to internally verbalize as they prepare for a task, guide themselves through performance, counteract worry through encouragement, and reinforce successful performance.	Overcoming negative thoughts ²³ , therapeutic/graded exercise ¹² , visual/graded imagery techniques ²⁵ , gamified rehab. ²⁶
Behavioral factors		
Self-monitoring	Objective monitoring of one's own symptoms (numeric rating of intensity, frequency, duration, etc.)	Mindfulness meditation ⁵ , biofeedback ⁴ , pain diary ¹⁰ , yoga ¹² , tai chi ²⁷ , planning/pacing activity ²⁸ , sleep hygiene. ²⁹
Relaxation	Meditation, conscious/neutral awareness of one's body, promote more parasympathetic activity.	Autogenic training ³⁰ , mindfulness meditation ⁵ , massage ³¹ , yoga ¹² , tai chi ²⁷ , planning/pacing activity ²⁸ , sleep hygiene ²⁹ , visual/guided imagery techniques. ²⁵
Behavioral rehearsal of skills	Adopting a desired set of skills through modeling, role-playing, rehearsal, and positive feedback.	Communication/assertiveness training ²³ , gamified rehab. ²⁶
Problem-solving training	Objectively and accurately defining the problem. Encourage rational problem solving by minimizing impulsiveness, carelessness or avoidance.	Overcoming negative thoughts ²³ , cognitive restructuring ²³ , planning/pacing activity ²⁸ , pain education. ²⁴
Behavioral activation	Increasing engagement in pleasant activities, increasing behaviors that counter avoidance.	Pleasant activity scheduling ³² , social abilities training ³³ , planning/pacing activity ²⁸ , visual/guided imagery techniques. ²⁵
Behavioral contracting	A statement or agreement outlining positive and negative consequences of performing certain behaviors.	Pain diary ¹⁰ , cognitive restructuring ²³ .
Habit reversal	Identification of habits or tics, and countering these habits with more benign actions (e.g. applying lotion to hands instead of biting nails) or through therapist/social reinforcement.	Social abilities training ³³ , biofeedback ⁴ , gamified rehab. ²⁶
Situational factors		
Exposure therapy	Controlled and repetitive exposure to certain stimuli. Systematic desensitization.	Autogenic training ³³ , therapeutic/graded exercise ¹² , social abilities training ³³ , communication/assertiveness training ²³ , planning/pacing activity ²⁸ , visual/graded imagery techniques ²⁵ , pain education ²⁴ , gamified rehab. ²⁶
Response Prevention	Blocking out avoidance behaviors or "safety behaviors". E.g. Clients are prevented from performing compulsive rituals as they confront their specific triggers	Social abilities training ³³ , biofeedback ⁴ , gamified rehab. ²⁶

Figure 1. Clinical implications of CBT

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