



Editorial Article

Cognitive Behaviour Therapy: Significance in Temporomandibular Joint Disorders

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Introduction

The masticatory system is responsible for performing a few of the most complex activities such as chewing, speaking and swallowing which makes it the preliminary functional unit of the human body. This seemingly simple complex system comprises bones, joints, ligaments, muscles and teeth.

Temporomandibular Joint [TMJ] is one of the simplest joints in the body but subject to the most complex vector forces due to masticatory muscular parafunction. (1)

The physical disorders arising from an imbalance in the delicate working relationship of the jaw and skull with the muscles that attach to and move the jaw as well as the nervous system associated with these systems comprise the Temporomandibular joint Disorders [TMDS] (2)

Temporomandibular Joint Disorder

The term TMD has many precursors such as Costen's Syndrome as coined by James Costen in 1934. However, Bell popularized the term Temporomandibular disorders which included problems not isolated to TMJs but include all disturbances associated with the function of the masticatory system. To avoid the great confusion from the wide variety of terms, The American Dental Association gave the term 'Temporomandibular Disorders' to all functional disturbances of the masticatory system.



TMD is one of the most misdiagnosed disorders hence not treated correctly either. It is a multifactorial disorder where several factors act as an etiologic agent. Hence, the treatment aimed should be multidirectional as well.

Causes of TMD

There are five basic etiologic factors for Temporomandibular Joint Disorders. (1)

These are –

- Occlusal factors
- Trauma
- Emotional Stress
- Deep Pain Input
- Parafunction

These factors can cause the disease only when the adaptive capacity/ adaptability of the individual (such as – genetic factors, biologic factors, or hormonal factors, etc) is reduced.

Psychological Aspect as a Causative Agent for TMDs

Emotional Stress is one of the five etiologic factors as described by Sir Jeffrey P Okeson.

The emotional centers of the brain influence muscle function. The Hypothalamus, the reticular system and particularly the limbic system are primarily responsible for the emotional state of the individual. (1) The muscle activity is affected by these centers in numerous ways, gamma efferent pathways are one amongst them. The body reacts to stress by activation of the Hypothalamus-pituitary-adrenal axis (HPA axis). The activity of gamma efferents is increased through complex neural pathways by the HPA axis. This leads to the contraction of the intrafusal fibers of the muscle spindles. Which in turn leads to stretching of the muscle and causes a reflex contraction. The outcome of which is the increase in muscle tonicity. (1,3)



“Stress”, as described by Hans Selye, “the non-specific response of the body to any demand made upon it”. Psychologic stress is an intricate part of our lives and is linked to the kind of force an individual would experience. A stressor could even be a driving force to success and achievements. (1,4)

There can be two basic types of stress based on the releasing mechanisms – (1)

- External stress releasing mechanism – physical exercise, shouting, cursing, hitting, throwing objects.
- Internal Stress releasing mechanism – irritable bowel syndrome, hypertension, cardiac arrhythmia, asthma, or an increase in the tonicity of the head and neck musculature.

Emotional stress not only increases the tonicity of head and neck muscles but it can also increase levels of non-functional muscle activities such as bruxism/ teeth clenching. (1,4)

Thus, affecting an individual’s autonomic nervous system which constantly monitors and regulates numerous subconscious systems that maintain homeostasis.

This derangement in the sympathetic system makes emotional stress an important etiologic factor for TMD, which many clinicians fail to understand.

Treatment Aspect- Definitive Treatment

It becomes very important to recognize the underlying cause of psychologic disorder which many dental practitioners are not often trained for leading to uncertainty.

Nevertheless, dental surgeons who attempt to treat TMDS should be able to appreciate these problems and effectively identify the cause so that a multidisciplinary approach of treatment can be done with appropriate referrals.

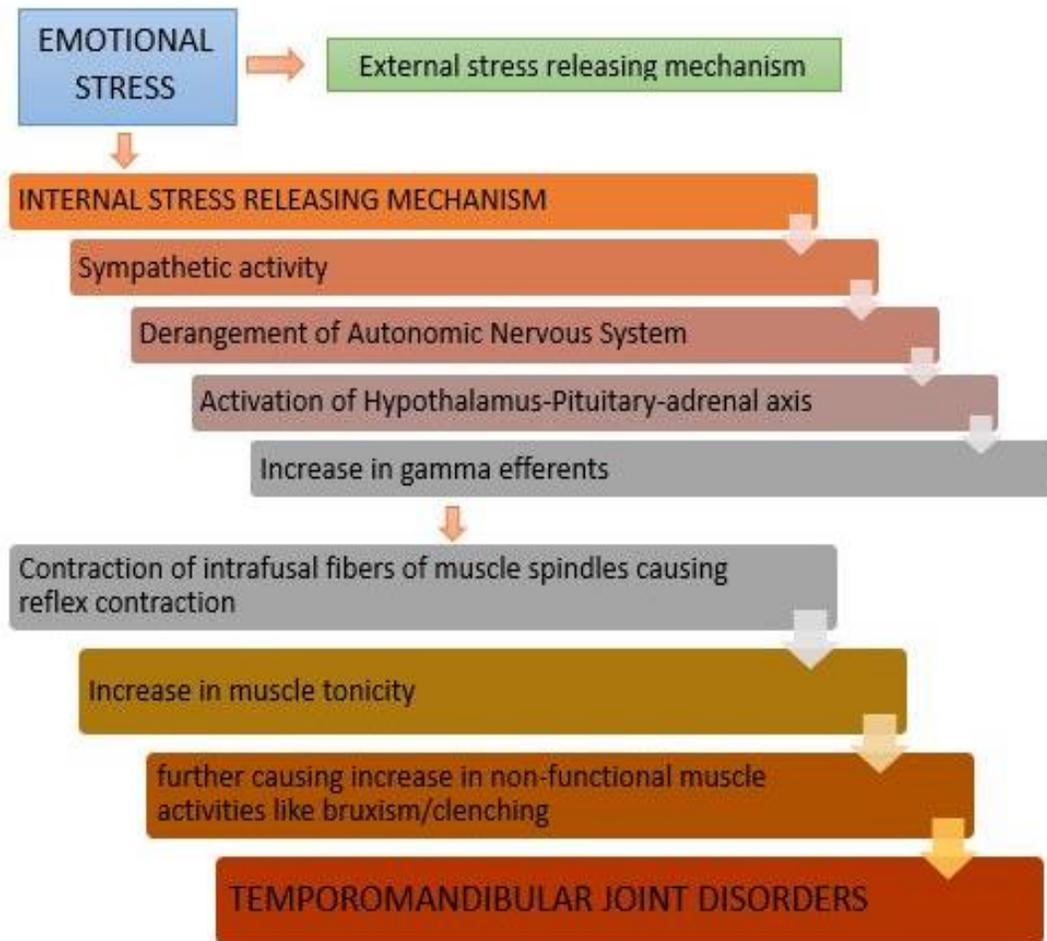


Figure 1- Graphic model representing the causal relationship between emotional stress and TMDS.

Cognitive Behaviour Therapy

Chronic TMD patients generally experience increased levels of anxiety, frustration and anger which contribute to emotional stress leading to TMDS.

Cognitive Behaviour Therapy is a therapeutic intervention in the psychosocial aspect which focuses on changing unhelpful cognition distortions and behavior, improving emotional regulation and developing personal coping strategies that target solving the problems being faced.



Types of Cognitive / Bio -Behavioural Therapies for TMDs

Whenever psychological therapy / cognitive behavior therapy is indicated it becomes important for the treating dental surgeon to identify the need for referral to a properly trained therapist. A dental surgeon who is not well versed or is not comfortable in treating emotional stress should not attempt to do so.

- **EDUCATION AND COGNITIVE AWARENESS TRAINING (1,5-7):** Treating Dental Surgeon should elicit a thorough case history to identify the presence of emotional stress / psychological factors if any. These concepts can be new and uncommon to patients and they need to be educated regarding this. Patients should be made aware of their condition. Presence of parafunctional habits if any is also imperative to identify and should be brought to patients' notice.
- **RESTRICTIVE USE (1,8,9):** Following the general rule of "If it hurts, don't do it" should be followed even in TMDs. The patient should be instructed to function within a painless range of movements, small bites, avoid abusing the jaw with voluntary chewing and clenching.
- **VOLUNTARY AVOIDANCE (1,10,11):** Once the awareness regarding nonfunctional contacts has been achieved, they should be voluntarily avoided. The lips, teeth, and jaws should assume a relaxed position. This can be accomplished by a simple exercise of puffing a little air between lips and teeth which allows the jaws to assume a relaxed position. This should be repeated throughout the day to reverse the habit and to maintain the mandible in the rest position. Parafunctional habits occurring in sleep that cannot be controlled voluntarily should be avoided with the help of other methods such as an occlusal appliance. Emotional stress can also be controlled to some extent voluntarily. Once a stressor is identified, the patient is asked to avoid them or the frequency and duration of exposure to them should be reduced.
- **RELAXATION THERAPY (1) :**

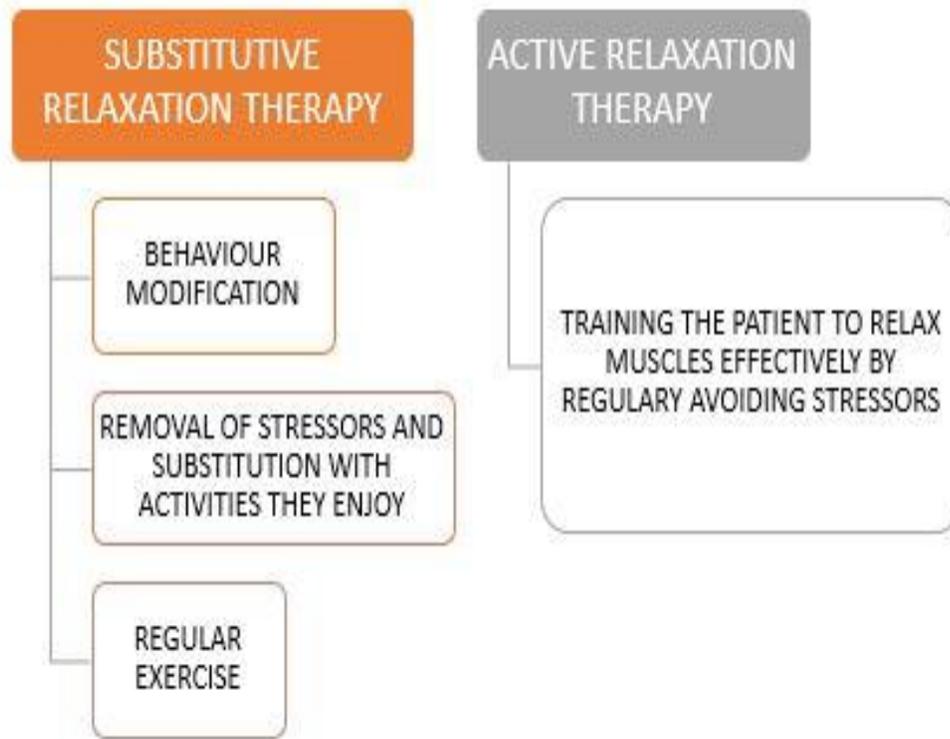


Figure 2 - Broad classification of relaxation therapy

Training the patient to relax effectively can be accompanied by using several techniques:

Progressive relaxation – methods modified by Jacobson's method developed in 1968 gave rise to progressive relaxation (12). Tense the muscles and then relax them until the relaxed state can be felt and maintained patient is instructed to concentrate on relaxing the peripheral areas (hands and feet) and to move progressively centrally to the abdomen, chest and face. Results were enhanced by having the patient relax, preferably by lying down in a comfortable environment with the eyes closed. This therapy has proven affected in several studies (13-24) and is best done with the help of well-trained therapists.

Progressive relaxation in reverse approach- This is also proven to be effective where the patient instead of contracting and then relaxing the muscles, passively stretch and then relax the muscles. This is more effective as contraction causes pain and makes relaxation an uphill task.

Self-hypnosis



Meditation

Yoga

Biobehavioral approaches

1. Biobehavioral approaches (25,26) – behavior-based strategies for helping patients develop better management of their pain. A five-step process of change that has been developed in the literature. (27) Precontemplation- in the pre-contemplation phase, the individual is not aware of a need for change.
2. Contemplation phase- when awareness is developed she/he has moved to the stage of contemplation individual is weighing the costs and benefits of change for themselves.
3. Preparation for taking action- The individual is taking the steps necessary to make a successful attempt at change.
4. Action- the individual implements the new behavior.
5. Maintenance – the individual is doing those things that are necessary to continue with the changes that were implemented in the 4th stage.

Consideration of each of these stages of change helps the orofacial pain clinician appreciate the challenges that a patient faces when confronted with information that suggests s/he may need to change in the same way to obtain pain relief.

Physical Self-Regulation Program – This was developed jointly by scientist-practitioners at the University of Kentucky and the National Naval Dental Center provides skills training for orofacial pain management during two 50- min training sessions.

These training sessions target proprioceptive re-education, relaxation skills, criterion-based diaphragmatic breathing, increased physical activity, sleep hygiene instructions and fluid/ nutrition management as areas for change.

Based on laboratory research findings (28,29) it has shown significant relief of pain (average of 69% reduction) and improved jaw function immediately after training and six months follow up evaluation.

Change talk (25)

clinician can encourage the patient and it typically involves three components:

1. Enabling the patient to speak about the disadvantages of his/her current status



2. Have the patient to speak about the advantages of making a change.
3. Helping the individual to express specific intentions to change

A clinician who fosters change talk will discover that an individual becomes much more willing to begin the process of change and will persist in efforts to change until old habits have been altered.

When empathetic listening is done a patient feels like she/he is truly understood.

The stepped approach in Self-regulation training (25)

1. Foundational step – Basic skills in PSR or self-care strategies: the basic protocol for PSR establishes a foundation for understanding and regulating behaviors that can contribute to trigeminally mediated pain conditions. Home PSR training alone provides the necessary skills for effective pain management.
2. Advanced progressive relaxation/ Biofeedback strategies can build upon this basic foundation as the 2nd level of Bio-behavioral training.

Training in Progressive relaxation techniques or specific BIOFEEDBACK modalities (1,25) – This is a technique that assists the patient in regulating bodily functions that are generally controlled unconsciously. It has been used to help patients alter certain functions such as blood pressure, Blood flow and brain wave activity as well as muscle relaxation.

It is accomplished by electromyographically monitoring the muscle state, end-tidal CO₂ following which training to increase blood flow to peripheral areas, hand temperature and control level of CO₂ in blood. This augments the basic self-regulation abilities that are obtained through PSR training

1. Engaging in specific cognitive-behavioral psychotherapies that address issues such as depression, PTSD, or other psychologic concerns, that may be interfering with normal functioning and contributing to the maintenance of chronic pain stress.

This stepped approach of Biobehavior strategies can maximize the efficiency with which persons in pain develop the resources that are needed to improve their ability to manage pain experience efficiency.



Important Considerations in Using Emotional Stress Therapy

1. Evaluation of the level of emotional stress in a patient's life is extremely difficult. It is not the number of stressors that a patient is experiencing that is significant but the impact that these stressors have on the patient's overall health and function.
2. When high levels of emotional stress are suspected as an etiologic factor contributing to a disorder, stress reduction therapy should be initiated. Simple and non-invasive procedures are preferred. Seeking help from trained professionals in behavioral modification and psychologic therapy should be done as and when necessary.
3. Doctor-patient relationship is the most important and effective method of reducing stress. Great effort should be taken by the doctor to minimize the patient's apprehension, frustration, hostility, anger and fear.
4. Emotional stress is a difficult factor to assess, it can easily become a scapegoat for unsuccessful treatment. But most importantly, the failure of treatment is associated with failure to reach the proposed treatment goals or an improper diagnosis.

Significance of Cognitive Behavior Therapy In Treating TMDs

Numerous studies (30-33) have been conducted to evaluate the effectiveness of a tailored approach to cognitive behavior therapy in TMD patients. All of these studies have concluded that cognitive behavior therapy/ biobehavioral is effective in treating TMDS especially when they are chronic. It is not just an adjunctive therapy but even when used solely has proven to be effective. This shows the importance of using CBT as an important treatment modality in TMDS.

Conclusion

Psychologic emotional stress related to TMDS and the need for identifying and treating it appropriately cannot be overemphasized. A dental surgeon that is attempting to treat TMD should be able to understand its causal relationship with emotional stress and should take the initiative towards treating it with cognitive/ biobehavioral interventions.



It becomes imperative to be able to assess the impact of a stressor and the need for successful referral for cognitive therapy. This requires an adroit dental practitioner who has established strong working relationships with competent specialists who are skilled in delivering the biobehavioral intervention.

The ideal professional model should be followed to do the best for the patient. The onus of a successful treatment lies solely in the hands of the treating dental surgeon.

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