

Beyond Orofacial Pain

Examining the Psychosomatic Dimensions of Temporomandibular Disorders

NARRATIVE REVIEW

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Abstract

Temporomandibular disorders are commonly recognized through jaw pain, restricted mandibular movement, joint sounds, and masticatory muscle tenderness. These clinical signs, however, do not fully explain the severity, persistence, or functional consequences of symptoms in many patients. Psychological stress, anxiety, depressive symptoms, somatic symptom burden, pain catastrophizing, sleep disturbance, and maladaptive coping can shape how temporomandibular pain begins, is interpreted, and becomes chronic. This narrative article examines temporomandibular disorders through a psychosomatic and biopsychosocial framework. The term psychosomatic is used to describe reciprocal interactions between bodily processes and psychological experience, not to imply that pain is imaginary or exclusively psychogenic. Prospective evidence from the Orofacial Pain Prospective Evaluation and Risk Assessment program indicates that global psychological and somatic symptoms, perceived stress, and negative affect predict first-onset painful temporomandibular disorder. Biological pathways may include autonomic and hypothalamic-pituitary-adrenal dysregulation, altered jaw-muscle activity, sleep disruption, peripheral nociception, and central sensitization. Clinical assessment should therefore combine a validated physical examination with measurement of pain-related disability, emotional distress, somatic symptoms, sleep, and oral behaviors. Conservative physical treatment remains important, but persistent or complex presentations may require cognitive behavioral therapy, stress regulation, graded activity, sleep intervention, and coordinated multidisciplinary care. A careful psychosomatic formulation validates the patient’s physical experience while identifying modifiable factors that can improve function and quality of life.

Keywords: temporomandibular disorders; psychosomatic factors; somatic symptoms; psychological stress; orofacial pain; biopsychosocial care

Abbreviations

Abbreviation	Meaning
CBT	Cognitive behavioral therapy
DC/TMD	Diagnostic Criteria for Temporomandibular Disorders
HPA	Hypothalamic-pituitary-adrenal
OPPERA	Orofacial Pain Prospective Evaluation and Risk Assessment
PHQ-15	Patient Health Questionnaire-15
TMD	Temporomandibular disorder

Abbreviation	Meaning
TMJ	Temporomandibular joint

Introduction

Temporomandibular disorders (TMDs) comprise musculoskeletal and neuromuscular conditions involving the temporomandibular joints (TMJs), masticatory muscles, and associated tissues. Patients may report regional pain, headache attributed to TMD, joint noises, locking, reduced mouth opening, fatigue during chewing, or changes in daily function. Although some presentations are brief and self-limiting, others persist despite repeated dental or medical treatment. The mismatch that may occur between structural findings and symptom severity has encouraged a broader account of TMD pain (List & Jensen, 2017; National Academies of Sciences, Engineering, and Medicine [NASEM], 2020).

A psychosomatic perspective addresses this broader account by examining how bodily pathology, nervous-system regulation, emotion, cognition, behavior, and social experience interact. It does not deny joint or muscle pathology. Instead, it asks why similar physical findings cause little difficulty in one person but prolonged pain and disability in another. This question is central to accurate diagnosis, respectful communication, and proportionate treatment.

Understanding the Psychosomatic Perspective

Psychosomatic medicine developed in response to the limitations of strict mind-body separation. Engel's biopsychosocial model proposed that illness is best understood across biological, psychological, and social levels rather than through biological lesions alone (Engel, 1977). In TMD, the biological level includes joint inflammation or degeneration, muscle overload, trauma, nociceptive input, and pain-processing differences. Psychological processes include perceived stress, anxiety, low mood, symptom attention, pain beliefs, coping, and fear of movement. Social influences include work demands, family responses, access to care, financial strain, and previous experiences with clinicians.

The word psychosomatic can be misunderstood as meaning "caused by the mind." A clinically useful definition is reciprocal: physical symptoms affect mood, sleep, behavior, and relationships, while psychological and social conditions can alter muscle activity, autonomic arousal, pain modulation, and treatment engagement. The pain remains real regardless of how much each domain contributes. This formulation protects patients from dismissal and protects clinicians from pursuing an exclusively structural explanation when the evidence does not support it.

Evidence for Psychological and Somatic Associations

The strongest evidence comes from studies that measured psychological characteristics before TMD developed. In the Orofacial Pain Prospective Evaluation and Risk Assessment (OPPERA) cohort, several premorbid variables predicted first-onset painful TMD. Reported somatic symptoms, perceived stress, adverse life events, and negative affect were associated with incidence, and the combined measure of global psychological and somatic symptoms was the most consistent predictor in multivariable analysis (Fillingim et al., 2013). OPFERA's broader findings support a model in which multiple vulnerabilities converge rather than a single cause producing every case (Maixner et al., 2011; Slade et al., 2016).

Other longitudinal evidence shows that depressive and anxiety symptoms can precede TMD pain. Kindler et al. (2012) found that depressive symptoms were especially associated with later joint pain, whereas

anxiety symptoms were associated with muscle pain. These associations do not establish that distress alone causes TMD. They show that psychological state and broader symptom burden influence vulnerability alongside local tissue and behavioral factors.

Cross-sectional research consistently reports higher depression, anxiety, stress, and somatization among people with TMD than among controls. Yap et al. (2002) demonstrated associations between TMD diagnostic patterns, depression, and somatization in clinical patients. A recent systematic review and meta-analysis likewise found significant relationships between TMD and anxiety, depression, stress, and somatization across diverse populations (Saini et al., 2025). Cross-sectional results may reflect both cause and consequence because persistent pain itself can generate distress. They are therefore most useful for identifying treatment needs rather than assigning blame.

Somatic Symptoms as Clinical Information

Somatic symptoms include fatigue, dizziness, gastrointestinal discomfort, sleep problems, headache, palpitations, and pain in multiple body regions. When many symptoms occur together, clinicians may use the term somatic symptom burden. The Patient Health Questionnaire-15 (PHQ-15) is a brief validated instrument for grading this burden (Kroenke et al., 2002). A high score is not proof of a psychiatric disorder, fabrication, or absence of disease. It is a signal to examine medical comorbidity, medication effects, emotional distress, sleep, health anxiety, and patterns of pain amplification.

Somatic burden matters in TMD because jaw pain often overlaps with headache, neck pain, widespread musculoskeletal pain, fibromyalgia, irritable bowel symptoms, and fatigue. This clustering suggests partially shared mechanisms. Repeated nociceptive input can increase central nervous system responsiveness, a process termed central sensitization. The resulting hyperalgesia, reduced pain thresholds, and expansion of painful areas may allow symptoms to persist after the original peripheral trigger has diminished (Woolf, 2011). Central sensitization is one possible mechanism, not a diagnosis that should be applied to every patient.

Symptom attention also affects experience. A person who interprets jaw sensations as evidence of progressive damage may monitor the area closely, avoid movement, and repeatedly test the bite. These behaviors can heighten salience and reduce confidence in normal movement. Conversely, clear explanation and graded use can reduce threat while preserving appropriate attention to genuine warning signs.

Mechanisms Linking Stress and Orofacial Pain

Stress can influence TMD through several connected pathways. Sympathetic activation and hypothalamic-pituitary-adrenal (HPA) regulation affect arousal, sleep, inflammation, and pain modulation. Stress may also increase awake tooth contact, clenching, guarded posture, and repetitive jaw-muscle activity. These behaviors can fatigue sensitized muscles even when they are not the original cause of the disorder. Poor sleep further reduces pain inhibition, increases fatigue, and weakens emotional regulation.

Pain then feeds back into the same system. Difficulty eating, speaking, sleeping, or working can increase worry and low mood. Fear of provoking pain may lead to restricted jaw movement and social avoidance. Catastrophizing can magnify expected harm, while unsuccessful procedures may strengthen the belief that the condition is severe or irreversible. Over time, peripheral nociception, central pain processing, distress, and behavior can form a self-maintaining cycle. The proportions differ between patients, which is why a standardized treatment applied without formulation often produces inconsistent results.



Integrated Clinical Assessment

Assessment should establish a physical diagnosis and a psychosocial formulation. The Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) provide this structure. Axis I uses history and standardized examination to identify pain-related and intra-articular diagnoses. Axis II evaluates pain intensity, disability, distress, and behavioral factors (Schiffman et al., 2014). The two axes are complementary. A patient may have demonstrable myalgia or arthralgia and simultaneously have insomnia, depression, or high somatic burden that changes prognosis and treatment requirements.

The clinical history should address onset, duration, location, aggravating movement, locking, trauma, headache, sleep, oral behaviors, prior treatment, medication, and interference with eating, work, and social activity. Examination should assess mandibular range, familiar pain on movement or palpation, joint sounds, and dental or neurologic alternatives. Imaging should be used when findings are likely to change management, not simply because pain is severe.

Brief screening can include pain-related disability, PHQ-15 somatic symptoms, depression, anxiety, catastrophizing, sleep quality, and oral behaviors. Clinicians should explain that these questions are routine because pain is influenced by the nervous system, sleep, mood, and daily habits. Screening scores require clinical interpretation and do not independently establish a mental disorder. Fever, swelling, unexplained weight loss, cranial nerve findings, progressive occlusal change, cancer history, or a new severe headache requires prompt medical assessment.

A concise formulation can then organize findings into predisposing, precipitating, perpetuating, and protective factors. Predisposing factors may include previous pain or longstanding anxiety; a dental procedure, injury, or stressful event may precipitate symptoms; poor sleep, clenching, avoidance, and catastrophizing may perpetuate them; and supportive relationships, physical activity, and confidence in self-management may protect function. The formulation should remain provisional and should be revised when symptoms, examination findings, or life circumstances change.

Management Beyond the Orofacial Region

Initial care should usually be conservative and reversible. Education should validate the pain, explain the diagnosis, and describe how joint or muscle loading interacts with sleep, stress, and pain regulation. Useful measures may include temporary modification of painful chewing, avoidance of sustained clenching, relaxed jaw posture, graded jaw exercises, physical activity, local heat or cold, and appropriate short-term analgesia. Manual therapy and selected occlusal appliances can help some patients, but irreversible occlusal procedures should not be justified solely by psychosomatic symptoms or nonspecific imaging findings (Durham et al., 2015; Gil-Martínez et al., 2018).

Psychological treatment becomes relevant when distress, catastrophizing, fear, insomnia, trauma-related symptoms, or somatic burden interferes with recovery. Cognitive behavioral therapy (CBT) can modify threatening interpretations, avoidance, and ineffective coping. Relaxation, biofeedback, mindfulness-informed practice, and sleep-focused intervention may reduce arousal and support self-management. A systematic review found that psychological interventions can reduce painful TMD symptoms and may offer added benefit when combined with standard treatment, although the certainty of evidence varies (Christidis et al., 2024).

Referral should be presented as an expansion of pain care, not a rejection of the physical complaint. Complex cases may require coordination among dentistry or orofacial pain, primary care, physiotherapy, psychology, nursing, sleep medicine, neurology, rheumatology, or psychiatry. Shared outcomes should



include chewing tolerance, mouth opening, sleep, participation, emotional distress, and confidence in self-management as well as pain intensity. National recommendations emphasize that fragmented services and variable professional education remain major barriers to effective TMD care (NASEM, 2020).

Nursing and Interprofessional Implications

Nurses are well placed to identify the psychosomatic dimensions of TMD because they often assess sleep, medication use, stress, functional ability, and symptoms beyond the jaw. They can reinforce jaw-relaxation strategies, graded activity, treatment adherence, and realistic recovery goals. They can also detect deteriorating mood, medication overuse, or red flags requiring referral.

Language is part of treatment. Statements such as “nothing is wrong” or “the pain is psychological” can increase shame and health anxiety. A more accurate explanation is that the pain is real, the jaw and nervous system are both involved, and stress or sleep can change the intensity without creating an imaginary symptom. Consistent explanations across the team reduce conflicting advice and unnecessary procedures.

Research and Clinical Limitations

Much of the psychosomatic literature remains observational, uses different diagnostic criteria, and cannot determine the direction of causation. Future studies should use repeated measures of stress, sleep, somatic symptoms, oral behavior, and pain to identify temporal pathways. Trials should test matched-care approaches and report function, quality of life, psychological outcomes, adverse effects, and long-term durability. Psychosomatic assessment should improve precision and compassion, not become a new label applied without evidence.

Conclusion

TMD pain extends beyond the orofacial region because it is shaped by interactions among tissues, nervous-system regulation, psychological experience, behavior, and social context. Stress, anxiety, depression, somatic symptoms, disturbed sleep, and pain-related beliefs can influence onset and persistence, while chronic pain can intensify the same factors. A psychosomatic formulation therefore complements physical diagnosis rather than replacing it. Standardized examination, respectful psychosocial screening, conservative treatment, and matched interdisciplinary care offer the clearest route to reduced disability and restored quality of life.

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