



Deepening the Understanding of Somatization in TMD Pain: A Topical Review

Hye-Kyoung Kim, Mee-Eun Kim

Department of Orofacial Pain and Oral Medicine, Dankook University College of Dentistry, Cheonan, Korea

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Correspondence to:

Mee-Eun Kim

Department of Orofacial Pain and Oral
Medicine, Dankook University College of
Dentistry, 119 Dandae-ro, Dongnam-gu,
Cheonan 31116, Korea

Tel: +82-41-550-1915

Fax: +82-505-434-7951

E-mail: meunkim@dankook.ac.kr

<https://orcid.org/0000-0001-9332-532X>

An association between psychological factors and temporomandibular disorders (TMD) has been extensively explored for over 40 years, and a high prevalence of depression and somatization has been consistently reported in patients with TMD. Current evidence suggests that patients' somatic awareness can serve as a primer for TMD incidence and further contribute to the transition to chronic pain. However, the current understanding of somatization from a medical perspective is limited. The best way to address patients with TMD pain who have somatization is also unclear. Therefore, this paper aims to provide an overview of somatization in the context of pain psychology and address its clinical implications in the context of TMD pain.

keywords: Pain; Somatization disorder; Somatoform disorder; Temporomandibular joint disorders

INTRODUCTION

An association between psychological factors and temporomandibular disorders (TMD) has been extensively explored for over 40 years, with a systemic review demonstrating a high prevalence of depression and somatization in patients with TMD [1]. Ongoing studies on the interaction between the two conditions have been of great interest to clinicians, contributing to a transition in the understanding of the etiological concepts of TMD from the bite to the mind. The shift in the concepts of pain from a biomedical model to a more holistic biopsychosocial approach, first proposed by Engle in 1977 [2], led to the introduction of the Research Diagnostic Criteria for TMD (RDC/TMD) in 1992 [3]. RDC/TMD, the first evidence-based diagnostic criteria for TMD, was extensively used in clinical and research settings because it incorporated a dual-axis system reflecting the biopsychosocial model, composed of physical diagnoses (axis I), and psychosocial assessment (axis II) as the core structures for diagnosis. The current criteria for TMD

(DC/TMD), the successor to RDC/TMD, were published in 2014 to improve the diagnostic validity of physical assessments for clinical use while also incorporating a dual-axis system [4]. Depression, anxiety, and physical symptoms are key domains in the axis II assessment of the RDC/TMD and DC/TMD [5].

The key significance of the dual-axis system used in the diagnostic criteria for TMD is due to the medically unexplained symptoms reported by patients with TMD which can be acknowledged by entering an evidence-based diagnosis criterion from hysteria or neurosis. DC/TMD includes the results of the Orofacial Pain: Prospective Evaluation and Risk Assessment (OPPERA) studies which utilized heuristic models to highlight the role of two dimensions, multiple psychological distress and pain amplification, as putative risk factors for the persistence of TMD pain [6]. This dynamic longitudinal project conducted between 2006 and 2013 investigated etiological factors associated with the first onset of TMD and its transition to chronicity using a prospective cohort and a case-control study design [7]. The

noteworthy psychosocial findings from the OPPERA study were that somatic awareness, which is the general tendency to endorse physical symptoms, was the most robust predictor of TMD incidence and also played an etiological role in persistent TMD [6-9]. These findings suggest that individuals with high somatic awareness are more likely to report TMD-related symptoms and signs in the future. However, a relative paucity in the literature on somatization and TMD exists despite the existence of extensive evidence on the affective dimensions of psychological distress (e.g., depression and anxiety). Furthermore, pain psychology and the role of somatization in the initiation of TMD pain and progression into chronicity have not been sufficiently evaluated.

Therefore, the current manuscript aims to provide a review of available evidence on somatization in the context of pain psychology and discuss its clinical implications concerning TMD pain.

SOMATIC AWARENESS AND SOMATIZATION FROM THE PERSPECTIVES OF TMD PAIN AND PSYCHIATRY

The prospective cohort OPPERA study found that somatic awareness was the strongest predictor of TMD incidence [9], and the contributions of other more traditional psychological parameters (e.g., perceived stress, depression, anxiety, and pain-coping strategies) were much smaller in comparison [9]. Interestingly, somatic reactivity to sensory stimuli did not predict first-onset TMD, suggesting that it was not identical to somatic awareness [9]. A systematic review published in 2018 and focusing on axis II findings in TMD patients found that the prevalence of severe-to-moderate depression and somatization was high in this population, while severe physical disability was relatively uncommon [1]. A multicenter study examining the correlation between axes I and II of the RDC/TMD found that the highest observed degrees of pain-related impairment corresponded to grades I or II on the Graded Chronic Pain Scale, indicating low disability/low-intensity pain [10]. Furthermore, pain disability in TMD patients was associated with axis II findings (e.g., depression, somatization, and treatment-seeking behavior) more frequently than axis I diagnoses [10]. Evidence on the significant association between

somatization and TMD pain emphasizes the critical role of the former in the diagnosis and management of the latter, consequently highlighting the need for developing a better understanding of the psychopathology of mental health problems, particularly somatic awareness, to promote a more holistic approach to the complex and dynamic psychology of TMD pain.

Thus, what is the difference between somatic awareness and somatization? Somatic awareness and the somatic and physical symptoms used in the assessment of TMD pain differ from the use of the term somatization in the field of psychiatry although the terms somatic awareness and somatization are frequently used interchangeably in the literature on TMD pain and associated psychological distresses. Understanding that somatic symptoms alone do not define somatization, with the use of the latter in psychiatry requiring a disparity between somatic symptoms and relevant physical findings, is important. In contrast, somatic awareness of TMD pain is a general tendency toward increased frequency and severity of reported physical or somatic symptoms [9,11].

From a psychiatric perspective, the term “somatization,” first introduced by Wilhelm Stekel in 1924, refers to the hypothesis that deep-seated neurosis can lead to a bodily disorder [12]. The prefix “soma” means body in Greek. From a historical point of view, somatizing patients were traditionally diagnosed by physicians as having hysteria, which had a bad connotation and was considered a malady primarily affecting women, or hypochondriasis, which was considered to be the male counterpart [11,12]. Since then, a more acceptable and scientifically neutral approach has been adopted in clinical settings through the use of the term “medically unexplained symptoms” [11].

Somatization, according to Lipowski [12,13], is the tendency to experience and manifest psychological distress as somatic symptoms despite the absence of demonstrable objective medical evidence. Somatizing patients, common in healthcare settings worldwide, pose significant diagnostic and treatment issues because they tend to make extensive use of medical facilities at greater costs and may or may not have psychiatric illnesses [12]. Evidence suggests that these patients respond to numerous psychosocial stressors in a somatic rather than a psychological manner, and they

consider these physical symptoms as being indicative of medical illnesses [12]. Somatization is not the same as other medically unexplained symptoms and is not intentional in the way malingering and factitious are. Moreover, the latter manifests itself through motor or sensory neurologic symptoms while the former is characterized by more nonspecific somatic symptoms (e.g., shortness of breath, heart palpitation, headache, fatigue, back pain, and abdominal pain among others) although both somatization and conversion disorders are real [14].

Although the definition of somatization remains unclear from both a medical and psychiatric viewpoint [12,15], Kirmayer [16] proposed three perspectives to aid physicians in understanding it. The first is the presentation of physical symptoms in the absence of a biological cause. The second views somatization as a more culturally acceptable, nonverbal way of presenting somatic symptoms as a metaphor for personal or social difficulties when compared to verbal expressions of distress. The third definition considers somatic signs and symptoms of illness caused by emotional stress (e.g., depression and anxiety) [16]. Therefore, somatization is a spectrum of symptoms rather than a diagnosis.

Currently, a gap in the medical and psychiatric perspectives of somatization was noted, with it often being referred to as a functional condition in medicine because of the altered functioning of the neurological system [11]. The psychiatrist's perspective has evolved over time, resulting in a plethora of diagnostic definitions. In this field, somatization was first identified as somatoform, a hypothetical diagnostic category substituting neurosis disorder in the Diagnostic and Statistical Manual (DSM)-III [15]. Thus, in the DSM-III, the term "somatization," which refers to the more etiological view that somatic symptoms are caused by mental illnesses, was replaced with "somatoform" which implies that the symptoms are still related to mental illness but are less objectionable [11]. With the DSM update, the definition of somatoform disorders has been modified to reflect the difficulty and complexity of diagnosing this condition. The exclusion of physical findings from somatic symptoms was overemphasized in subsequent DSM-IV criteria for somatoform disorders (e.g., somatization, conversion disorder, panic disorder, hypochondriasis, and body dysmorphic disorder; Table 1) [15,17]. However, confidently ruling out medical

abnormalities for the somatoform disorder is difficult in clinical settings. In addition to their existing medical conditions, patients with irritable bowel syndrome, myocardial infarction, and cancer can present with excessive somatic symptoms. Considering the increased ambiguity in the state exclusion criteria of DSM-IV [15,17], somatoform disorders were replaced with somatic symptom disorders (SSD) in the latest version of DSM-V to reflect a shift in perspective to interface between psychiatry and medicine exists along a spectrum and to put less emphasis on a dichotomous view of the body and mind (Tables 2 and 3) [17-19]. SSD combines old diagnoses (e.g., somatization disorder, hypochondriasis, and pain) [18]. Somatization is a key SSD symptom, with the degrees of symptom severity ranging from mild to severe (Table 2). The SSD criterion in the DSM-V does not require medical clearance and, instead, considers the consistent presence of maladaptive thoughts, feelings, and behaviors, as well as one or more somatic symptoms for at least 6 months (Table 2). In the case of predominant pain, a previous subgroup of pain conditions in the old DSM-IV diagnosis may be indicated. For example, if a patient had jaw pain for more than 6 months and reported difficulty in performing daily tasks due to an excessive focus on negative thoughts about the pain despite an absence of specific findings other than familiar pain upon palpation of the masseter muscles, they would be diagnosed with SSD with predominant pain using the DSM-V and myalgia using the

Table 1. Diagnostic and Statistical Manual-4 terminology related to medically unexplained somatic symptoms

Somatoform disorder	Key feature
Somatization disorder	Multiple somatic symptoms
Conversion disorder	Neurologic symptoms without medical causes
Hypochondriasis	Fear of having a serious illness The three main symptoms include believing the existence of a disease, associated worries about the disease, and treatment-seeking behaviors.
Body dysmorphic disorder	Repetitive and intrusive thoughts about physical appearance
Pain disorder	Pain that is primarily related to psychological factors

Data from the article of Ghanizadeh and Firoozabadi (Psychiatr Danub 2012;24:353-358) [17].

Table 2. Diagnostic and Statistical Manual of Mental Disorders-5 criteria for somatic symptom disorders

A	One or more somatic symptoms that are distressing or result in significant disruption of daily life
B	Excessive thoughts, feelings, or behaviors related to the somatic symptoms or associated health concerns manifested by at least one of the following: <ol style="list-style-type: none"> 1. Disproportionate and persistent thoughts about the seriousness of one's symptoms. 2. Persistently elevated levels of anxiety about health or symptoms. 3. Excessive time and energy devoted to these symptoms or health concerns.
C	Although any one somatic symptom may not be continuously present, the state of being symptomatic is persistent (typically >6 months). Specify if: <ul style="list-style-type: none"> • With predominant pain (previously pain disorder): this specifier is for individuals whose somatic symptoms predominantly involve pain. Specify if: <ul style="list-style-type: none"> • Persistent: a persistent course is characterized by severe symptoms, marked impairment, and long duration (>6 months). Specify current severity <ul style="list-style-type: none"> • Mild: only one of the symptoms specified in criterion B is fulfilled. • Moderate: two or more of the symptoms specified in criterion B are fulfilled. • Severe: two or more of the symptoms specified in criterion B are fulfilled, plus multiple somatic complaints exist (or one very severe somatic symptoms).

Adapted from Diagnostic and Statistical Manual (DSM) of Mental Disorders (5th ed., 2013) [19].

Table 3. DSM-5 terminology related to medically unexplained somatic symptoms

Somatic symptoms disorder	Key feature
Somatic symptoms disorder	An umbrella term including DSM-4 diagnoses (e.g., somatization disorder, hypochondriasis, and pain disorder)
Conversion disorder	Neurological symptoms without medical causes
Illness anxiety disorder	Hypochondriasis without somatic symptoms
Factitious disorder	False reporting or faking of medical and/or psychological symptoms without malingering
Malingering	An intentional reporting of some symptoms with an expectation of reward. Not a psychiatric disorder.

DSM, Diagnostic and Statistical Manual of Mental Disorders.

DC-TMD [4].

The etiology of somatoform pain (SP), one of the core symptoms of the somatization spectrum, and a predisposition toward experiencing and communicating somatic distress in response to psychosocial stress [20] are still unknown. A high prevalence of negative childhood experiences, insecure attachment, interpersonal sensitivity, and trouble expressing and controlling affections has been observed in patients with SP [20]. Interestingly, functional magnetic resonance imaging studies suggested a shared neural circuit between the somatization process and pain signaling by demonstrating that both patients with SSD [21] or pain (e.g., chronic lower back pain [22] and fibromyalgia [23]) exhibited hypersensitivity to experimental pain and amplification of pain signaling in the areas of the brain that modulate affective motivation (anterior cingulate cortex, insula, and prefrontal cortex). Genetics and epigenetics investigations also suggest polymorphisms in the opioid system [24] and

the catechol-O-methyltransferase genes [25] as probable pathways for generic vulnerability to SP. Understanding the history of the somatization spectrum and how it relates to pain can provide invaluable clinical insights into TMD pain with an elevated level of somatic symptoms.

CLINICAL ASSESSMENT AND IMPLICATIONS

The clinical management of individuals presenting with chronic and even multiple TMD pain that is unlikely to be fully explained by physical examination is challenging. Previous clinical studies have indicated the coexistence of depression, anxiety, and somatization in patients with TMD pain, and these patients are frequently referred to as TMD with high psychological distress. The biopsychosocial model of pain recognizes the critical importance of the multidimensional aspects of pain and integrates psychosocial factors, including those of a cognitive and affective nature,

with the sensory dimension of pain to better understand those experiencing pain at different times and under varying circumstances, potentially leading to better pain management [26]. Currently, this model represents a key theoretical approach to pain management, and its incorporation into TMD pain allows two axes of assessment, including the physical axis (axis I) and the psychosocial axis (axis II) in the RDC/TMD [3] and the DC/TMD [4]. Somatic symptoms are commonly observed during the assessment of TMD and are evaluated using a somatization subscale of the Symptom Checklist-90-Revision (SCL-90R) [27]. The SCL-90R, a multidimensional questionnaire for screening psychological distress in clinical settings [27], is a part of axis II of the RDC/TMD [4] and is used to measure the severity of psychiatric symptoms. The somatization dimension of the SCL-90R is one of nine subscales that measure distress from a bodily perspective, taking into consideration cardiovascular, gastrointestinal, respiratory, and other autonomic dysfunction-related symptoms [27]. In axis II of the DC/TMD, the Patient Health Questionnaire-15 is used to measure the severity of physical symptoms [4]. The inclusion of assessing somatic awareness and symptom reporting in the diagnosis criteria of (R)DC/TMD reflects the vital role of somatization in the evaluation and management of individuals with TMD from onset to development of chronicity [8,9]. However, it is important to note that the somatic symptoms offered by (R)DC/TMD simply include the severity and frequency of physical symptoms reported by individuals and not somatization, which must be diagnosed based on a psychiatric evaluation by a clinical psychologist. Consequently, clinicians who assess patients with TMD pain must be more careful when using the term somatization in the absence of psychiatric illnesses identified by a psychologist [26] and, if no psychiatric diagnosis is available, somatic awareness and physical symptoms are more acceptable terms to describe the overall tendency toward reporting somatic symptoms in these patients.

Individuals with orofacial pain demonstrate an increased tendency to report other physical symptoms in addition to TMD pain. Occlusal dysesthesia (OD) is a rare condition characterized by a prolonged feeling of discomfort and altered bite without evident occlusal discrepancy [28,29]. It is one of the major challenges for dental clinicians and can

be a big problem for afflicted patients. Occlusal adjustment, orthodontic, prosthodontic, and restorative therapies are all examples of dental procedures that may cause OD [28,29]. Despite the ambiguity and complexity of its pathophysiological etiology, other terminologies for OD, including occlusal neurosis, phantom bite, and occlusal hyperawareness, emphasize its significance in psychological problems (e.g., mood and personality disorders) [30]. Hypervigilance of altered dental proprioception in particular has been suggested, as a possible explanation for OD [29], with Reeves and Merrill [31] describing it as a somatoform disorder.

Persistent idiopathic facial pain and persistent idiopathic dentoalveolar pain, like OD, have been linked to psychogenic origins including depression and somatization (a term used in the bibliography) [32-34]. A large population-based prospective study evaluated somatization (a term used in the bibliography) at baseline and found it to be the strongest predictor of chronic widespread pain, as defined by the American College of Rheumatology criteria for fibromyalgia [35]. Despite several clinical studies demonstrating a strong link between somatic awareness or somatization and pain, little is understood about how somatic symptoms affect pain. Different mechanisms, based on various hypotheses, may be involved in the manifestation of somatic symptoms into pain. Evidence suggests that the multidimensional and complicated interactions between psychological, biological, and sociocultural factors may play a role [15,16], with somatic sensations being interpreted as symptoms under the influence of experience, self-image, culture, illness belief, and emotional arousals and, consequently, leading to chronic disability due to the maintenance of factors (e.g., depression via pessimistic cognitive schemas), anxiety via self-observation and selective perception motivated by fear, and unacceptable interpersonal relationships [36,37]. A geographic and cultural perspective of somatization has also been proposed, wherein Asian patients primarily exhibit mental stress through somatic manifestations (e.g., dry mouth, musculoskeletal pain, fatigue, headache, dizziness, and nervousness) [16]. Increased physical symptom reporting has been attributed to hypervigilance to somatic sensations [37] and salient interoception [38].

HOW TO APPROACH PATIENTS WITH HIGH SOMATIC AWARENESS

In comparison to standard care protocols, psychological intervention for chronic orofacial pain, including TMD pain, has shown a weak but consistent improvement in pain, pain-related disability, and quality of life [39-41]. Of the various psychological interventions, cognitive-behavior therapies (CBTs), particularly cognitive therapy, have been shown to have limited efficacy in the treatment of patients with TMD pain and high psychological distress [42-44]. CBTs, which are a combination of cognitive and behavioral therapy, is based on the biopsychosocial concept of pain and address maladaptive thoughts and behaviors. The cognitive therapies include a reappraisal of thoughts, mindfulness, and distraction, while the behavioral strategies include breathing control and relaxation [26]. In patients with reduced disability, behavioral treatments appear to be beneficial [45,46]. A recent meta-analysis of 15 randomized controlled trials (RCTs) involving 1,671 participants found that CBTs were effective in reducing somatic symptoms, anxiety, and depressive symptoms, as well as improving physical functioning in individuals with somatoform and medically unexplained physical symptoms diagnosed using the DSM-III or IV [47]. It did not, however, improve social functioning or decrease the frequency of visits to the doctor [47].

Studies examining the relationship between CBTs and somatization in the realm of orofacial pain are currently lacking. A recent narrative review on the effects of CBT on orofacial pain, including TMD pain, found a positive effect on pain management [48]. The effects of standard treatment methods (e.g., splint therapy, anti-inflammatory agents, and soft diet) and CBTs on TMD pain were compared in a well-designed RCT trial [44]. In a study by Litt et al. [44], the CBTs were focused on relaxation, stress management, and cognitive restructuring to target pain beliefs, appraisals, coping, and catastrophizing, which are all known to play a part in the dysfunction of patients with TMD pain [49]. The results showed that addition of CBTs to the standard treatment protocol yielded greater reduction in pain, disability, and depression in patients experiencing TMD over a 52-week follow-up period when compared to the conventional treatment methods [44]. The most intriguing finding was

that CBTs were only effective in patients who had an elevated level of self-efficacy and a low level of somatization. Dworkin et al. [43] also found that patients with high somatization did not benefit from brief CBTs. These disparities in outcomes across psychiatry and orofacial pain may be attributed to differences in the diagnosis and assessment of somatization as well as variations in the treatment methods used (e.g., CBT duration) between studies. The heterogeneity between studies in patients presenting with somatic symptoms could also potentially have played a role in the diverse outcomes.

Previous evidence suggests that somatic and affective symptoms may be alleviated with CBTs, although frequent medical utilization and social functioning appear to be unaffected. Current TMD research proposes that somatization (a term used in the bibliography) may be a key moderator in determining the effect of CBTs on patients with TMD pain and high psychological distress. Regardless of conflicting findings on the effects of CBTs on somatization in patients with TMD pain, clinicians face a challenging task in recognizing and managing somatic symptoms and somatic awareness in these patients, especially given the historical debate over the definition of somatization and the lack of systemic training in CBTs for physicians. Many unanswered questions exist, and more evidence on the effects of CBT on TMD pain with somatic awareness or somatization is necessary along with the development of upgraded protocols for study designs (e.g., clarity in the definition of somatization, long-term application of detailed CBTs, and so on).

Communicating with patients who have an elevated level of somatic awareness or somatization is also vital in a real clinical setting. One of the key factors of successful medical care is a good relationship between the patient and doctor [50]. Despite its importance, doctors frequently struggle to interact with and manage somatizing patients [51,52] because the medical condition of the patient is often unclear and/or unusual and the absence of objective findings in a patient complaining excessively of vague and fluctuating symptoms can make diagnosis and treatment challenging. These two factors play a significant role in complicating the treatment of patients with severe somatic symptoms or medically unexplained symptoms. Thus, higher somatizing tendencies and more frequent medical utilization often

resulted in greater difficulties in the interpretation of the patient's symptoms by the physician [51]. Thus, a patient with severe somatization and disability should be referred to a psychiatrist and managed using a psychopharmacological and psychotherapeutic approach [20]. However, the doctor-patient relationship can be negatively affected even if the patient reluctantly accepts the referral if a doctor refers a patient to a psychiatrist without first building a rapport. Patients often interpret a referral to a psychiatrist as a sign that their doctor does not trust them and, consequently, tend to search for a new doctor, thereby perpetuating the vicious cycle of doctor shopping.

Even though it takes time, establishing trust in a patient-doctor relationship is critical. Patients with severe somatization, who are known to struggle with social functions (e.g., interpersonal sensitivity and attachment) may be able to learn to understand and regulate their symptoms through a trusting connection with a doctor, resulting in enhanced quality of life [47]. Meanwhile, doctors must also be explicit in their explanations, avoiding any ambiguity that could exacerbate anxiety, when discussing somatic symptoms with patients with somatization. Clinicians must use an empathetic approach when figuring out what the patient's symptoms signify. It is also critical for clinicians to be cautious of the language and context they use to describe their patients so that the patient does not feel that their pain is entirely due to psychiatric causes.

CONCLUSION

A lack of knowledge on the pathophysiology of somatic awareness or somatization in patients with TMD pain is currently noted. In addition, current evidence suggests that patients' somatic awareness can serve as a primer for TMD incidence and further contribute to the transition to chronicity. The effects of CBT on somatization are not satisfactory, given the limited number of clinical investigations. Further studies on the exact nature of the relationship between somatic awareness or somatization and pain are necessary to prevent people with unexplained somatic symptoms from becoming "medical orphans" in terms of TMD diagnosis and treatment.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

ORCID

Hye-Kyoung Kim

<https://orcid.org/0000-0002-0734-5533>

Mee-Eun Kim

<https://orcid.org/0000-0001-9332-532X>

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