

Personality Characteristics of Patients With Temporomandibular Disorders: Diagnostic and Therapeutic Implications

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One hundred ten patients complaining of nondental orofacial pain of more than 3 months' duration were psychologically evaluated with the Minnesota Multiphasic Personality Inventory. Four distinct personality profiles were found: psychophysiological reaction, in 52% of the patients; depressed reaction, in 11% of the patients; defensive reaction, in 12% of the patients; and "no diagnosis" (normal), in 24% of the patients. These results indicate that chronic temporomandibular pain patients present personality characteristics that are similar to those of other chronic pain patients according to the Minnesota Multiphasic Personality Inventory. The diagnostic and therapeutic implications of each profile are reviewed and discussed in terms of a medical model of temporomandibular disorders.

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Psychological factors are widely considered to influence the dynamics of temporomandibular disorders (TMDs).¹⁻¹⁴ McCall et al¹⁵ report that TMD patients respond to certain questions on the Minnesota Multiphasic Personality Inventory (MMPI) in a predictable manner that is different from the response of controls. Moulton¹⁶ reports temporomandibular joint (TMJ) dysfunction patients to have a set of personality types that are distinct from those of atypical facial neuralgia patients, and he proposes a linkage between anxiety, the etiology of painful symptoms, and the patient's reaction to those symptoms. Lupton¹⁷ is also able to distinguish TMD patients from other illness groups on the basis of personality characteristics. Shipman¹⁸ concludes that "MPD [myofascial pain disorder] women have serious emotional conflicts, but they also have a strong need to hide them. When a life stress is added to their burden they break out with a somatic reaction, eg, development of the MPD syndrome." More recently, investigators have separated TMD patients by diagnostic subgroup and found a stronger correlation of psychological factors with nonorganic (myogenous) TMDs than with organic (arthrogenous) ones.^{3,9,19,20}

The prevalence of characteristic psychological traits among TMD patients strongly suggests a psychosocial component in the etiology of such disorders. No evidence suggests that a particular profile is sufficient or necessary for any particular TMD, only that a psychological component is common. Most investigators have emphasized the existence of the various psychological characteristics; few have addressed the diagnosis and treatment implications of their findings. The purpose of this paper was to report the personality profiles of a TMD population and to relate the findings to patient management.

Materials and Methods

The study group was made up of 110 consecutive patients (30 men and 80 women; age range 18 to 73 years) who had reported to the National Naval Medical Center outpatient dental clinic complaining of nondental orofacial pain. Each patient had experienced, for more than 3 months, one or more of the following conditions: TMJ pain with ear symptoms and/or joint sounds; masticatory muscle pain; a combination of muscle pain and TMJ pain; myofascial trigger points with referred pain; or painful limitation of mandibular function. Pain of at least 3 months' duration was a universal complaint.

An attending dentist reviewed each patient's medical history, evaluated each patient's general health, and performed a clinical examination of the head and neck, including the dentition. Panoramic radiographs of both TMJs were also taken. The health histories, clinical examinations, and radiographic evaluations of the 110 TMD patients revealed no evidence of associated systemic or neoplastic disease or current drug therapy that might have altered the emotional status of the subjects.

At the time of initial examination, after obtaining written permission, a psychiatric technician administered an MMPI to each qualifying patient. A psychologist (EH) hand scored each inventory without interviewing the patient and without access to clinical data obtained by others. She plotted, coded, and then grouped the test results using standard published criteria.²²⁻²⁴

The MMPI is one instrument commonly used for making a preliminary psychological assessment. It consists of 566 true-false questions that are designed to elicit a wide range of self descriptions which, when properly interpreted, provide a set of quantitative descriptors of a patient's personality. The questions evaluate topics ranging from the assessment of subjective physical condition to the moral and social attitudes of the patient. It takes about 90 minutes to complete and requires very little instruction or supervision to administer.

On the basis of standard scoring, each subject receives a test profile composed of four validity scales and ten clinical scales (Table 1), a full description of which is found in the MMPI Manual.²² In scoring the MMPI, the mean raw scores of normal men and normal women are used as reference norms. The degree of variation above and below the mean is expressed in terms of a T score that can range from 20 to 120. A T score of 50 on a scale is the norm; a T score over 70 connotes psychopathosis related to that scale. Combinations of elevated and depressed T scores on dif-

Table 1 The MMPI Scales

Scale name	Abbreviation	Code number
Validity scales		
Cannot say score		
Lie	L	
Infrequency	F	
Correction	K	
Clinical scales		
Hypochondriasis	Hs	1
Depression	D	2
Hysteria	Hy	3
Psychopathic deviate	Pd	4
Masculinity-femininity	Mf	5
Paranoia	Pa	6
Psychasthenia	Pt	7
Schizophrenia	Sc	8
Hypomania	Ma	9
Social intraversion	Si	0

Table 2 Summary of the MMPI Profiles for 110 TMD Patients

Diagnosis	No. of patients (%)
Psychophysiological reaction	57 (52)
Depression reaction	12 (11)
Defensive reaction	13 (12)
No diagnosis	27 (24)
Invalid	1 (1)

ferent scales have been grouped by various authors into characteristic profiles.

Results

The test results fell into four distinguishable personality profiles and one invalid inventory (Table 2). Normal profiles (no psychiatric diagnosis) were found for 27 patients (24%) (Fig 1). The remaining 83 patients had profiles containing patterns of elevation that were broadly characteristic of certain personality disturbances. Psychophysiological reaction profiles, characterized by elevations in scales 1 and 3, were found for 57 patients (52%) (Fig 2). Depression reaction profiles, characterized by an elevation in scale 2 with scales 1 and 3 remaining normal, were registered for 12 patients (11%) (Fig 3). Defensive reaction profiles, in which validity scales L and K were elevated and the clinical scales were artificially depressed, were found for 13 patients (12%) (Fig 4). An invalid profile was registered for one patient (Fig 5).

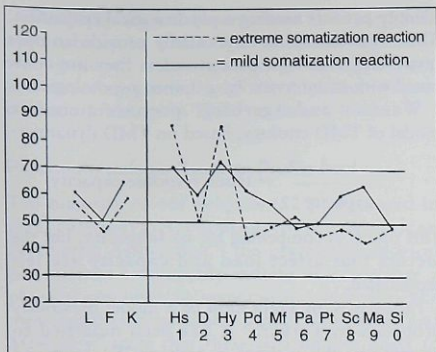


Fig 1 No diagnosis (normal) profile.

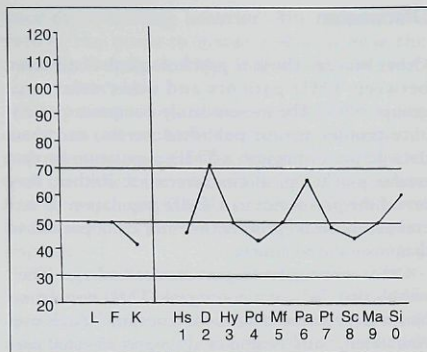


Fig 2 Typical psychophysiologic reaction profile.

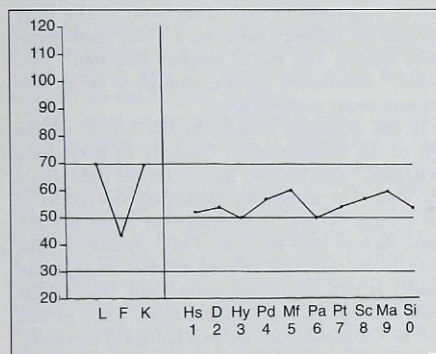


Fig 3 Typical depression reaction profile.

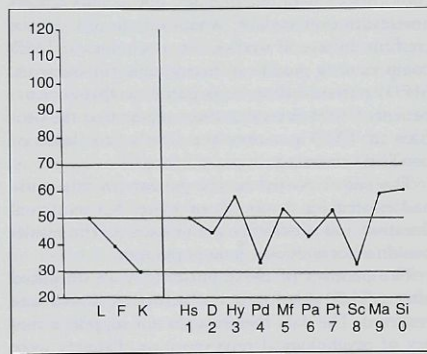


Fig 4 Typical defensive reaction profile.

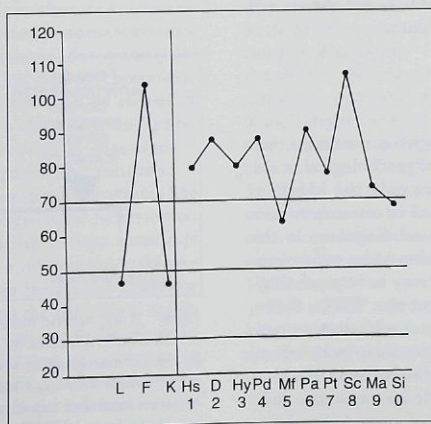


Fig 5 Invalid profile.

Discussion

Other studies show a psychological distinction between TMD patients and other treatment groups.^{13,14,17,25} The present study compares personality profiles against published norms, and these data do not distinguish a TMD population by particular psychological characteristics. Rather, they reveal the prevalence in a TMD population of several psychosocial profiles that may be important in diagnosis and treatment.

Other investigators report similar findings. Fine²⁵ reveals that 76% of a nonorganic TMD population had a psychiatric diagnosis. Lupton,¹⁷ Zach and Andreasen,¹³ and Beaton et al¹⁴ report elevated psychosomatic scores in TMD patients. Shipman¹⁸ reports elevations in MMPI scales 1, 2, and 3 in conformance with our findings, but he also reports an elevation in scale 4, which our results do not confirm. In several studies, the psychological TMD component is greater in nonorganic (myogenous, MPD) patients than in organic (arthrogenous) patients.^{3,9,19,20,26} Several authors report that the profiles of TMD patients are similar to those of nonTMD chronic pain populations.¹⁷⁻²⁹

The pain reported by the patients in this study had existed for 3 months or more, but its actual duration and persistence are unknown. The results could reflect a chronic pain population.

The profiles of these patients were obtained after a TMD developed and before treatment was rendered. The data therefore do not support a theory of psychological predisposition. Patients were in pain at the time of the inventories, and no data were collected before symptoms began. The preexistence of any particular profile is not shown nor can one be inferred from our data.

Clinical Implications

An interview by a psychologist is normally conducted in the clinical course of psychological evaluation. Blind evaluation using only the MMPI is effective as a screening protocol in research but not as a means of making a clinical diagnosis. In this survey, 75% of the patients should be psychologically diagnosed, because they may have psychological problems that can affect the TMD. Since, according to Oakley and coworkers,³⁰ dentists typically are ineffective in diagnosing psychological problems, some means should be established to ensure that a diagnosis is made by a qualified individual. The MMPI is but one of many well-validated psychometric screening instruments used to

identify patients needing a psychological evaluation. These instruments do not usually provide an adequate diagnosis of a patient unless they are combined with an interview by a trained psychologist.

Wanman and Agerberg³¹ propose a concise model of TMD etiology, based on TMD dynamics:

$$\frac{\text{load}}{\text{capacity}} \rightarrow \text{tissue response capacity}$$

This model is compelling for its simplicity, but the factors that affect load and capacity are left unspecified.

Figure 6 is an adaptation of a model previously proposed by Parker.³² It has been modified to incorporate the concept underlying Wanman and Agerberg's model. In the present model, if the load is within a patient's stomatognathic capacity, the tissue response is orthofunction; if the load exceeds the patient's capacity, a TMD (pathofunction) results. The model restates Shipman's proposal,¹⁸ mentioned earlier, though it takes into account many more factors.

In this expanded model, the five factors on the left of the balance affect capacity as previously described,³² and the five factors on the right affect the load. The reason for expanding the model in the present context is to depict the effect psychological factors may have on TMD dynamics. The data from this and related studies engage the model at two important points, one that affects load and one that affects capacity. Each profile will be described from the psychological literature, and then the clinical implications will be shown in terms of the expanded model.

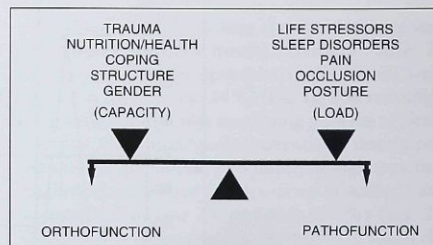


Fig 6 A hypothetical medical model for the etiology of TMD. The five factors on the left influence the capacity of the stomatognathic system; the five factors on the right affect the load on the system. The balance between load and capacity determines whether the system manifests a TMD (pathofunction) or functions within the stomatognathic capacity (orthofunction).

The psychological observations have particular applicability to TMD dynamics, although they were gathered from a general group of patients, and are often omitted from the discussion of psychological findings in TMD patients.

Psychophysiological Reaction Profile

The majority of our subjects (52%) appeared in this category. According to the American Psychiatric Association,³³ the psychophysiological patient may temporarily initiate or exacerbate a physical condition in response to psychologically meaningful environmental stimuli. Hathaway and McKinley²¹ state that these patients are likely to develop physical symptoms and not perceive the relationship between environmental stressors and their psychological and/or physical world when they are under stress. These patients will manifest physical symptoms solely in response to uncontrollable events, and the symptoms often do not equate with the physical findings.

The causal relationship between stress and psychophysiological behavior is important in the TMD patient, because such patients commonly exhibit elevated levels of stress.^{9,14,20,26,28,34,35} When life stressors are elevated, psychosomatic behavior is more likely to be clinically significant. Whenever a patient reports significant stressors, particularly when the symptoms of a stressed patient are inconsistent with physical findings, the dentist should suspect psychosomatic behavior and obtain a psychological diagnosis from a qualified clinician.

The psychophysiological profile interacts on both sides of the balance in Fig 6. Psychosomatic behavior is a coping mechanism that reduces the patient's capacity to withstand stomatognathic load, which lessens the potential for orthogenic function. The life stressors that feed psychosomatic behavior may also increase the load by means of increased muscle tone, sleep disorders, and parafunctional activity, as previously discussed,³² increasing the potential for pathogenic function.

The following extreme example illustrates the potential effect of psychophysiological behavior on TMD dynamics. A somatizing patient manifests life stressors in the form of a myogenous/arthrogenous TMD and perceives no behavioral cause for the symptoms. Being blind to the behavioral origin of the disorder, the patient can hardly be expected to adopt behavior modification as a course of treatment unless psychotherapy is instituted first to eliminate the somatization. If the somatization is not recognized and organic therapy, such as surgery, is offered, then the dentist is liable to rein-

force the somatizing behavior. After surgery, the patient can point to a scar and legitimize the enduring complaint: "My TMJ was so bad, even surgery didn't help."

The patient whose somatizing behavior is not corrected will probably continue to somatize in response to stress, and this will subvert efforts to treat the disorder in other ways. The clinician may find the psychophysiological patient unresponsive to traditional therapy that addresses only the tissue response.

The correlation between psychosomatic behavior and stress is especially important in TMD dynamics, because stress is synergistic with many other factors in TMD etiology.³² If psychophysiological behavior is diagnosed in a TMD patient, stressors should be suspected of playing a role in other ways.

From the psychologist's perspective, psychosomatic patients may profit from an understanding of the mind/body interaction. These patients must come to grips with the relationship between emotional stress and its expression as disease to participate in their own treatment and help prevent recurrence. The short-term response of these patients to behavioral measures, such as relaxation therapy or biofeedback, is often favorable. However, the long-term prognosis is usually poor for patients with extreme somatization reactions. Such patients may also resist therapy, because they need the attention and sympathy that they receive from health care professionals.

Depression Reaction Profile

This profile was exhibited by 12 patients (11%). Such patients are dysphoric, anxious, and emotionally distressed.²⁴ They usually have somatic symptoms and complaints such as a lower pain threshold, decreased appetite, concentration problems, fatigue, and sleep difficulties. In addition, they are oversensitive to criticism and personalize the actions of others towards themselves. Tolerance for frustration and ability to deal with stress appear to be lacking. Lowered pain thresholds, sleep difficulties, and an inability to deal with stress each represent a load factor in the expanded TMD model.

This profile represents another adverse coping behavior. Like the somatizer, the depressed patient may be faced with overwhelming life stressors and be unable to cope with them.

The above manifestations of depression interact with other factors to cause muscle hyperactivity and increased load, affecting the right side of the

balance. For instance, if a depressed patient has a lowered pain threshold, pain will cause a generalized increase in muscle activity, and the hyperactive muscle itself may become symptomatic. If the chronic pain of a TMD precipitates depressed reaction behavior and the pain threshold is lowered, a painful TMD and depression can perpetuate each other. Sleep disturbances secondary to depression may contribute to nocturnal bruxism, though the patterns of disturbance are usually different from those of the bruxer.³² The inability of a depressed patient to deal with stress may also potentiate stress as a synergistic force on the right side of the model. Interacting in several ways with TMD dynamics, depressive behavior is another potent factor in perpetuating a TMD, especially when depression is a TMD consequence.

In a poorly managed TMD patient, the depression may result from chronic, unremitting pain rather than from a situational crisis. According to psychologists, patients with chronic pain behavior tend to be uncooperative and not to respond psychologically well to cognitive behavioral therapy.³³ These patients should be aggressively treated for the causes of TMD pain in concert with pharmacologic therapy for the depression itself.

A recent study by Tversky and coworkers¹⁶ demonstrates this point. One group of 15 patients with TMJ pain dysfunction was considered psychiatrically normal. Another group of 45 patients had concurrent depressive illness. The latter group was divided equally into three treatment groups: one undergoing occlusal splint therapy, one receiving antidepressant medication, and the third having a combination of occlusal splint and antidepressant therapy. The combined therapy led to resolution of the painful problem and the depression, whereas the single therapies were only partly successful in relieving the pain/dysfunction.

Defensive Reaction Profile

Thirteen patients (12%) had a defensive reaction profile. These patients present themselves as overly conventional, socially conforming, and moralistic.^{22,24,37} They place extreme value on themselves, have trouble handling pressure, and have very little awareness of their motivations or the consequences of their behavior. Patients with this profile are potentially difficult to manage, especially for the dentist with scant education in behavioral science. Like patients with psychophysiological reaction profiles, they often tend to somatize when under stress. When doing so, they deny the stress

and always look for a physical cause for their symptoms.

The patient responding this way on the MMPI has a strong need to appear in the best possible light with a minimum of psychological problems. Patients with similar response styles tend to be simplistic and naive. These patients continually attempt to avoid unacceptable feelings, impulses, and problems, while viewing the world in terms of extremes of good and bad. They are likely to project a defensive facade of well-adjusted self-adequacy, even though many of them will have some type of behavioral disturbance beside the defensive reaction profile.

Patients with these profile scores adopt a life stance characterized by rigidity, inhibition, and excessive self-control. They deny their hostility and suspiciousness even though these attributes are apparent to everyone else. Patients with this profile tend to have high expectations of others but have trouble accepting personal limitations either in themselves or others. They have marked difficulties in expressing anger and behaving assertively. When anger does come out, it is a result of an accumulated buildup and often explodes in a self-righteous and highly rationalized outburst. Given this difficulty in effectual expression, it is probable that their internal cognitive world is in conflict and distressed.

This profile suggests an oversensitivity to criticism and a relatively low level of self-esteem.²² The ability to tolerate frustration and handle stress is limited. Under stress, specific physical complaints will appear, although this type of patient will deny any recent psychosocial stressors or interpersonal conflicts. These patients look for simplistic, concrete solutions to their problems, avoiding self-examination and concentrated effort.

A TMD patient with the need for simplistic, concrete solutions, and who does not require self-examination, may directly affront the therapeutic imperative for a complex, patient-centered TMD treatment strategy. As the model suggests, most TMDs are not simplistic in either their etiology or their management. Patients who undergo psychological or psychiatric treatment for defensive reaction behavior respond poorly because they tend to be too defensive to accept the treatment. Temporomandibular disorder therapy for these patients may fail for the same reason; these patients may not comply with the measures recommended. Defensive reaction behavior is potentially one of the most obstructive barriers to effective TMD management because these patients resist most therapeutic approaches.

No-Diagnosis Profile

The 27 patients (24%) responding in this category show no significant elevations from normal on any of the scales. These patients are psychologically well-adjusted and have no serious psychopathology.

In the model, these patients do not exhibit adverse coping behavior, so other factors can be addressed preferentially in TMD management. In contrast with the psychophysiological, depressed-reaction, and defensive-reaction profile patient, the no-diagnosis patient has a TMD prognosis that is unrelated to psychological intervention. The treatment strategy can address other diagnosed conditions.

Invalid Profile

One patient produced an invalid test profile, suggesting an extremely defensive and guarded response style. Such patients are trying to present themselves in the best possible light, denying any faults or weaknesses. Extreme defensiveness masks the results normally used to assess the profile. It is possible that psychological factors are contributing to the TMD, but the test results cannot prove it.

The patient whose profile was invalid was angry at the dentist and hostile toward previous TMD interventions. Invalidation of the test was deliberate. The patient was interviewed about the results and was relieved that the staff was accepting of her anger. The patient met with all members of the treatment team and the conflict was effectively resolved. The MMPI was not retaken.

Conclusion

Four behavioral profiles were identified among the MMPIs of 110 patients who presented with painful TMDs. In terms of a hypothetical model for TMD etiology, three of these profiles represent coping behaviors that can impair a patient's stomatognathic capacity.

The prevalence of abnormal psychological factors found by this study and others in the TMD patient population argues strongly that TMD patients should be psychologically screened. When screening identifies the need for a psychological or psychiatric diagnosis, a qualified clinician should be called upon to make it. The MMPI used in this study is one of several well-validated

screening devices. It requires nondental expertise for interpretation, however, and it cannot be the sole basis for making a psychological diagnosis.

Acknowledgments

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Resumen

Implicaciones Diagnósticas y Terapéuticas de las Características de la Personalidad en Pacientes Afectados por Desórdenes Temporomandibulares

Un grupo de 110 pacientes que presentaban dolor orofacial no relacionado a los dientes, fue evaluado psicológicamente por medio del Inventario de Personalidad Multifásica de Minnesota. El dolor tenía tres meses de duración. Se encontraron cuatro perfiles precisos de personalidad: reacción psicofisiopatológica (52%), reacción deprimida (11%), reacción defensiva (12%), y "sin" diagnosis ó normal (12%). Estos resultados indican que las características de la personalidad del paciente afectado por dolor temporomandibular crónico son similares a aquellas de otros pacientes con dolor crónico; aser evaluados con el Inventario de Personalidad Multifásica de Minnesota.

Zusammenfassung

Persönlichkeitsmerkmale von Patienten mit Myoarthropathien des Kausystems: Diagnostische und therapeutische Implikationen

110 Patienten, die seit mehr als 3 Monaten über nicht-dental bedingte Gesichtsschmerzen klagten, wurden mit dem Minnesota Multiphasic Personality Inventory-Test untersucht. Es konnten vier unterschiedliche Persönlichkeitsprofile festgestellt werden: Psychophysiopathologische Reaktion (52%), depressive Reaktion (11%), defensive Reaktion (12%), "keine Diagnose", d.h. normal (12%). Diese Resultate zeigen, dass der chronische Schmerzpatient mit Myoarthropathien des Kausystems im Minnesota Multiphasic Personality Inventory ähnliche Persönlichkeitsmerkmale aufweist wie andere chronische Schmerzpatienten.