

Knowledge and Beliefs of Dentists Regarding Temporomandibular Disorders and Chronic Pain

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To assess the knowledge and beliefs of practicing dentists regarding temporomandibular disorders and chronic pain, a random sample of dentists in the Kansas City metropolitan area was surveyed. A survey instrument examining knowledge and beliefs in four domains (psychophysiological, psychiatric disorders, chronic pain, and pathophysiology) was used. The responses of the practicing dentists were compared to the responses of panels of experts. Results indicated that dentists generally agreed with experts in the psychophysiological and psychiatric disorders domains but disagreed with the experts in the chronic pain and pathophysiology domains. Specialists and general dentists did not differ from one another in their responses. The findings partially replicate an earlier, similar survey of dentists in the Seattle, Washington, area. The findings suggest that the role of psychiatric disorders and psychophysiologic factors in the etiology of temporomandibular disorders is widely acknowledged by practicing dentists. However, there is considerable discrepancy between practicing dentists and temporomandibular disorder experts on the pathophysiology of temporomandibular disorders and how best to diagnose and treat these chronic conditions.

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A consensus has emerged among temporomandibular disorder (TMD) researchers that conservative, reversible methods are indicated in most TMD problems.¹ However, several surveys have suggested that practicing dentists use both conservative, reversible techniques and irreversible techniques in treating their TMD patients. For example, a survey of a TMD-related specialty group showed that the most common treatments for TMD, splints, occlusal equilibration, and anti-inflammatory medications, were used on 83%, 48%, and 40% of patients, respectively.² A larger-scale sample of American Dental Association members also showed that the most commonly used treatments for TMD were splints (68% of patients) and occlusal equilibration (30% of patients).³

Less information is available concerning what practicing dentists actually know and believe about TMD. Just et al⁴ surveyed five primarily orthodontic dental groups and found a large discrepancy between the scientific literature and the opinions reported in the survey. For example, two thirds of the respondents from all groups believed that an asymptomatic click was likely to be the precursor of more serious TMD problems, while recent long-term studies do not support this position.^{5,6}

A random sampling of general dentists and dental specialists in the Seattle, Washington, area found that practicing dentists tend to concur with expert opinion on the psychophysiological aspects of

TMD. However, they generally disagreed with expert opinion on issues regarding the pathophysiological domain of TMD.⁷

The purpose of this study was to examine the knowledge and beliefs of practicing dentists in the Kansas City metropolitan area about TMD. An additional goal was to replicate the Seattle study as closely as possible and to evaluate whether the Seattle results pertained only to dentists in that area or were also representative of dentists in another area of the country.

Materials and Methods

Survey Questionnaire

A mail survey (designed by the University of Washington and previously fielded in the Seattle area)⁷ was used to discover the knowledge and beliefs of dentists in four domains: (1) psychophysiological domain (the interaction of physical and psychological factors in the etiology, diagnosis, and treatment of TMD); (2) psychiatric disorders domain (disorders such as depression and somatization sometimes associated with TMD); (3) chronic pain domain (chronic pain behaviors); and (4) pathophysiology domain (biomedical/biomechanical aspects of TMD etiology, diagnosis, and treatment). Each domain was represented by a series of statements, and each statement was formatted on an 11-point scale in which 0 represented "strongly disagree," 10 represented "strongly agree," and 5 represented "neutral."

In the original Seattle study,⁷ statements were evaluated by panels of experts. Thirteen individuals who publish extensively in the refereed TMD literature formed the TMD expert group. All are members of the Neuroscience Group of the International Association for Dental Research (IADR) and/or the International Association for the Study of Pain (IASP), and all have extensive clinical and/or research experience with TMD patients. These individuals evaluated statements in the psychophysiology, chronic pain, and pathophysiology domains. Fourteen clinical psychologists practicing in multidisciplinary chronic pain clinics formed the second expert group. All are members of the IASP and contribute to the psychological literature on chronic pain. They evaluated statements in the chronic pain and psychiatric disorders domains.

The expert responses used in the Seattle study were also used for this study. Statements were said to generate expert consensus if more than 75% of the experts in the designated group endorsed either

an "agree" response (scored 7 to 10) or a "disagree" response (scored 0 to 3).

Sampling Method

The survey sampling method was designed to achieve a maximum response rate among busy professionals.^{8,9} The sampling frame was a list of licensed dentists in the greater Kansas City metropolitan area. The list was generated by combining membership rosters obtained from the Missouri Dental Association and the Kansas Dental Association. These rosters were culled to include only those dentists in the ZIP codes normally considered to make up the greater Kansas City metropolitan area. The final list was cleaned by checking it against the telephone directory and local dental society directories (greater Kansas City Dental Society and the Fifth District Dental Society) to verify address, specialty, and active practice status. Twenty-five percent of the general dentists in the greater Kansas City Metropolitan area (N = 169) were selected at random from the list. In addition, 25% of the specialists (excluding pedodontists and oral pathologists, considered unlikely to treat TMD patients) formed the specialists group (N = 34).

The survey was sent to each subject by mail along with a personalized letter and a business reply envelope. Nonrespondents were followed up with a postcard. If necessary, the survey was mailed a second time, with a personal telephone follow-up by a trained interviewer as needed. This survey was conducted between May and June 1991. Unlike the University of Washington study, no monetary incentive for responding to the survey was provided.

Results

The survey was returned by 104 general dentists (63%) and 21 specialists (62%). Response rates did not differ by gender, specialty, or ADA membership. The modal respondent in both groups was male and in solo practice. Specialists were significantly older than general dentists, treated more patients per week, and were more likely to treat TMD. The characteristics of both general dentists and specialists are presented in Table 1.

Preliminary analyses showed no significant differences between the responses of general dentists and specialists compared with expert opinions on the statements in the survey. Therefore, the two groups' responses were combined (N = 125), and their results compared to the experts' opinions.

The comparisons of practicing dentists with expert opinion on statements in the psychophysiological domain are presented in Table 2. For example, when asked their opinion on the statement "The mechanisms of acute and chronic pain are the same," all experts disagreed with the statement. As the first line in the table shows, only 61% of the practicing dentists held the same opinion as the experts. The difference between practicing dentists and experts was statistically significant, as assessed by Fisher's exact test (performed on the raw data, not the percentages shown in the table).

There was only one significant difference between practicing dentists and experts on statements in the psychiatric disorders domain (Table 3). In contrast,

practicing dentists differed with experts on all but one statement in the chronic pain domain (Table 4). Similarly, practicing dentists disagreed with the opinions of TMD experts on all but two statements in the pathophysiological domain (Table 5).

A lack of agreement with expert opinion in this survey could arise from two sources. The practitioners could disagree outright with expert opinion, or they could display uncertainty about each statement. Table 6 shows those statements on which more than one third of the practitioners gave responses in the "neutral" range (scoring 4 to 6 on the 0 to 10-point scale).

Discussion

The results of this survey show that there was agreement with the experts in the psychophysiological domain on most of the statements. In general, it appears that practitioners view stress and parafunctional activities as important contributing factors to TMD, and they view stress-reducing treatments as useful in TMD management. Disagreement arose over the mechanisms of acute versus chronic pain. Several factors could account for this finding, including a focus on acute pain rather than chronic pain in most dental practices.

Similarly, there was only one significant disagreement between the experts and practitioners in the psychiatric disorders domain. While both the expert panels and our sample of practicing dentists accepted the role that anxiety and depression can

Table 1 Respondent Characteristics

	General dentists (n = 104)	Dental specialists (n = 21)	P*
Percent male	90	100	ns
Percent in solo practice	58	40	ns
Mean age (y)	44	48	.001
Percent ADA members	88	90	ns
Mean no. of patients/w	51	82	.006
Percent treating TMD (15+ patients/y)	29	48	.050

*ns = nonsignificant.

Note: Student's *t* test used to assess differences between general dentists and specialists for continuous variables; chi-square used to assess differences for categorical variables.

Table 2 Percent of Practicing Dentists Concurring With Expert Response in the Psychophysiological Domain

Item	Expert response	Practicing dentists	P*
The mechanisms of acute and chronic pain are the same.	Disagree (100%)	61	.004
Tension and stress increase jaw muscle EMG levels in susceptible patients.	Agree (100%)	81	ns
Oral parafunctional habits are often significant in the development of TMD.	Agree (85%)	82	ns
Stress is a major factor in the development of TMD.	Agree (85%)	87	ns
Biofeedback can be useful for treating TMD.	Agree (77%)	53	ns
Stress management is indicated for many TMD patients.	Agree (100%)	90	ns
Progressive muscle relaxation is not an effective treatment for TMD.	Disagree (82%)	57	ns
Information on the daily pattern of TMD symptoms can be helpful for identifying contributing factors.	Agree (92%)	88	ns
Patients with TMD who clench/brux do so either during the day or at night, but not both.	Disagree (92%)	76	ns

*ns = nonsignificant.

Note: Differences between experts and practicing dentists assessed by Fisher's exact test with one degree of freedom.

Table 3 Percent of Practicing Dentists Concurring With Expert Response in the Psychiatric Disorders Domain

Item	Expert response	Practicing dentists	P*
Depression can be an important etiologic factor in chronic pain.	Agree (79%)	83	ns
Clinical depression is rare in chronic TMD patients.	Disagree (100%)	69	.019
Depressed mood is fairly common in chronic TMD patients.	Agree (86%)	73	ns
Anxiety disorders are more common in TMD patients than in the population at large.	Agree (79%)	60	ns

*ns = nonsignificant.

Note: Differences between experts and practicing dentists assessed by Fisher's exact test with one degree of freedom.

Table 4 Percent of Practicing Dentists Concurring With Expert Response in the Chronic Pain Domain

Item	Expert response	Practicing dentists	P*
PRN narcotics (ie, "as needed" for pain) are a treatment of choice when TMD pain is severe.	Disagree (93%)	46	.001
Chronic TMD patients should be advised to rest and limit their work and social activities when they are experiencing pain.	Disagree (85%)	27	.001
An extensive history of previous treatment failures in a TMD patient is usually an indication for surgery.	Disagree (100%)	70	.001
Although some TMD patients have psychological problems, these problems are usually unrelated to their pain.	Disagree (85%)	66	ns
Chronic pain is a behavioral as well as a physical problem.	Agree (96%)	67	.001
Antidepressants are never indicated in the management of TMD.	Disagree (88%)	65	.019
Difficulty with sleep is a common finding in chronic pain.	Agree (96%)	79	.049
Behavior modification treatments are appropriate for patients with chronic TMD pain.	Agree (88%)	67	.033
Some patients use pain as an excuse to avoid unpleasant chores.	Agree (89%)	61	.006
In determining whether a TMD condition is chronic, the only important factor is time since initial onset of symptoms.	Disagree (92%)	50	.003

*ns = nonsignificant.

Note: Differences between experts and practicing dentists assessed by Fisher's exact test with one degree of freedom.

play in TMD, the expert panel believed that clinical depression is much more common than did the practicing dentists. Studies have suggested that the prevalence of clinical depression in TMD patients ranges from 13.5% to 30%.^{10,11} These data suggest that while clinical depression is not characteristic of TMD patients as a whole, the condition is not rare.

However, there was disagreement with the experts on all but one of the statements in the chronic pain domain. Many of the disagreements appear to involve the behavioral and emotional

sequelae of chronic pain as well as appropriate medications for TMD. For example, practicing dentists disagreed significantly with the experts on the behavioral components of chronic pain ("Chronic pain is a behavioral, as well as a physical problem") and on appropriate medication strategies for TMD (eg, "PRN narcotics are a treatment of choice when TMD pain is severe"). Practicing dentists most strongly disagreed with the experts on the need for rest and limitations in work and social activities when TMD patients are in pain. This opinion contrasts with the recom-

Table 5 Percent of Practicing Dentists Concurring With Expert Response in the Pathophysiology Domain

Item	Expert response	Practicing dentists	P*
Balancing interferences are commonly related to TMD.	Disagree (85%)	10	.001
Nocturnal bruxism is caused by occlusal interferences.	Disagree (85%)	33	.001
Orthodontic treatment can prevent the onset of TMD.	Disagree (77%)	19	.001
Orthodontic therapy is the best treatment to resolve TMD in a patient with a skeletal malocclusion.	Disagree (92%)	28	.001
Occlusal equilibration is a useful early treatment for TMD.	Disagree (85%)	26	.001
TMD caused by trauma is much more difficult to treat and has far worse prognosis than other types of TMD.	Disagree (83%)	33	.001
The presence of arthritic changes on tomograms, along with crepitus in the joint indicates the need for treatment.	Disagree (77%)	32	.002
Arthroscopic surgery is almost completely effective in repositioning the disc in patients with internal derangements.	Disagree (100%)	52	.001
The position of the condyle in the fossa as seen in tomograms is a very accurate indication of internal derangement.	Disagree (92%)	46	.002
Ice packs and/or heat packs and passive muscle stretching are good early treatments for TMD.	Agree (100%)	65	.009
All individuals with clicking TMJs require treatment.	Disagree (100%)	95	ns
Transcranial films are the most accurate method for viewing the TM joint.	Disagree (77%)	49	ns

*ns = nonsignificant.

Note: Differences between experts and practicing dentists assessed by Fisher's exact test with one degree of freedom.

Table 6 Items Yielding High Numbers of "Neutral" Responses Among Practicing Dentists

Item (domain)	% Neutral
Chronic TMD patients should be advised to rest and limit their work and social activities when they are experiencing pain. (chronic pain)	52.2
Biofeedback can be useful for treating TMD. (psychophysiologic)	47.3
Transcranial films are the most accurate method for viewing the TM joints. (pathophysiology)	43.8
In determining whether a TMD condition is chronic, the only important factor is time since initial onset of symptoms. (chronic pain)	41.9
Nocturnal bruxism is caused by occlusal interferences. (pathophysiology)	41.6
Progressive muscle relaxation is not an effective treatment for TMD. (psychophysiologic)	41.5
TMD caused by trauma is much more difficult to treat and has a far worse prognosis than other types of TMD. (pathophysiology)	37.9

Note: Domain of item indicated in parentheses.

mentations of experts who urge chronic pain patients to increase activity levels during pain episodes to manage pain and avoid excess disability.¹²

Practicing dentists also had many disagreements with the experts in the pathophysiology domain. In most of the items, the views of the practicing dentists were in clear opposition to the experts. For example, experts overwhelmingly disagree with the statement that "balancing interferences are commonly related to TMD," whereas only 10% of the practicing dentists disagree with this statement.

Similarly, experts disagree that "orthodontic treatment can prevent the onset of TMD," but only 19% of the practicing dentists disagree. Since the pathophysiology domain may represent the area in which practicing dentists have the greatest training and knowledge, the disagreement with the expert panel may be a cause for concern.

As indicated in Table 6, there are several items in which practicing dentists have "neutral" opinions. Most of these items are in the pathophysiology domain. The uncertainty could arise from a lack of information on the subject or from a

knowledge of arguments on both sides of the issue, resulting in no clear opinion. Research-oriented continuing dental education or review articles in these specific areas might be of great value in clarifying dentists' current understanding of TMD in these areas and in reducing the time lag between scientific advances in the field and adoption of new principles in private practice. Perhaps such focused education would also help reduce the tendency to adopt scientifically unfounded methods and devices for diagnosis and treatment of TMD.

The findings of this study are, of course, specific to the Kansas City metropolitan area and may not be generalizable to other populations. Since not all the sample elected to fill out and return the questionnaire, it is possible that response bias may have affected the general outcome of this study. However, our data are similar to the Seattle survey for the psychiatric disorders and psychophysiological domains.⁷ The Kansas City sample reported greater disagreements with experts in the pathophysiological and chronic pain domains than the Seattle sample. Unlike the Washington study,⁷ no differences were found between the responses of general dentists and specialists compared with expert opinions in the present study. This difference may be most parsimoniously attributed to the smaller sample sizes for our study, especially for the specialist group.

Conclusion

The present findings suggest that the role of psychiatric disorders and psychophysiological factors in the etiology of TMD is widely acknowledged by practicing dentists. However, there is considerable discrepancy between practicing dentists and TMD experts on the pathophysiology of TMD and how best to diagnose and treat these chronic conditions. Future research is needed to determine how dentists' knowledge and beliefs relate to decisions about how to treat TMD.

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Resumen

Conocimientos y creencias de los dentistas respecto a los desórdenes temporomandibulares y al dolor crónico

Se realizó una encuesta en una muestra escogida al azar, de dentistas en el área metropolitana de Kansas City, para evaluar el conocimiento y las creencias de los dentistas practicantes en lo relacionado a los desórdenes temporomandibulares y al dolor crónico. Para realizar la encuesta se utilizó un método que examinó el conocimiento y las creencias en cuatro tópicos (psicofisiológico, desórdenes psiquiátricos, dolor crónico, y patofisiológico). Las respuestas de los odontólogos practicantes fueron comparadas con las respuestas de un grupo de expertos. Los resultados indican que los dentistas generalmente estuvieron de acuerdo con los expertos en cuanto a los desórdenes psiquiátricos y psicofisiológicos, pero discreparon con los expertos en lo relacionado al dolor crónico y a la patofisiología. Los especialistas y los dentistas generales no discreparon el uno del otro en cuanto a sus respuestas. Estos hallazgos replican los obtenidos anteriormente en una encuesta similar realizada en Seattle, Washington. Los resultados indican que el papel de los desórdenes psiquiátricos y los factores psicofisiológicos en la etiología de los desórdenes temporomandibulares es algo que es reconocido ampliamente por los odontólogos practicantes. Sin embargo, existe una discrepancia considerable entre los odontólogos practicantes y los expertos en desórdenes temporomandibulares, sobre la patofisiología de tales desórdenes y la mejor forma de diagnosticar y tratar estas condiciones crónicas.

Zusammenfassung

Was Zahnärzte über Myoarthropathien des Kausystems und chronische Schmerzen wissen

Eine zufällig ausgewählte Gruppe von praktizierenden Zahnärzten aus dem Gebiet von Kansas City wurde nach deren Kenntnissen und Meinungen über Myoarthropathien des Kausystems (MAP) und chronische Schmerzen befragt. Das Untersuchungsinstrumentarium unterschied Kenntnisse und Meinungen in vier übergeordneten Gebieten: Psychophysiologie, psychische Störungen, chronische Schmerzen und Pathophysiologie. Die Antworten der praktizierenden Zahnärzte wurden denjenigen von Experten gegenübergestellt. Die Meinung der praktizierenden Zahnärzte stimmte in den Gebieten der psychophysiologischen und psychischen Störungen mit denjenigen der Experten überein. Unterschiede zur Expertenmeinung fanden sich bei den chronischen Schmerzen und in der Ansicht zu Fragen der Pathophysiologie. Die Antworten der spezialisierten und der allgemeinen Zahnärzte unterschieden sich nicht. Die Resultate stimmen teilweise mit denjenigen einer ähnlichen Studie aus der Region Seattle, Washington überein. Die praktizierenden Zahnärzte sind der Meinung, dass psychische und psychophysiologische Störungen eine wichtige Rolle in der Entstehung der MAP spielen; in ihrer Ansicht über die Pathophysiologie, Diagnose und Therapie dieser chronischen Zustände weichen sie jedoch erheblich von der Expertenmeinung ab.