

# The Reporting of Pain, Somatic Complaints, and Anxiety in a Group of Patients With TMD Before and 2 Years After Treatment: Sex Differences

**Berit Schie Krogstad, MSc**

Physical Therapist  
Department of Prosthetic Dentistry and  
Stomatognathic Physiology

**Asbjørn Jokstad, Dr Odont**

Research Associate  
Department of Prosthetic Dentistry and  
Stomatognathic Physiology

**Bjørn L. Dahl, Dr Odont**

Professor  
Department of Prosthetic Dentistry and  
Stomatognathic Physiology

**Olav Vassend, PhD**

Professor  
Department of Community Dentistry  
University of Oslo  
Faculty of Dentistry  
Oslo, Norway

**Correspondence to:**

Ms Berit Schie Krogstad  
Department of Prosthetic Dentistry and  
Stomatognathic Physiology  
University of Oslo  
PO Box 1109, Blindern  
N-0317 Oslo  
Norway

*The aim of this study was to assess possible gender differences regarding the reporting of pain, somatic complaints, and anxiety in a group of patients suffering from temporomandibular disorders (TMD). The group consisted of 40 females and 13 males who received conservative TMD treatment comprising counseling, muscle exercises, and a stabilization splint. Before and 2 years after treatment, the patients answered three questionnaires (McGill Pain Questionnaire [Norwegian version] including a six-point scale, the Present Pain Intensity; a Somatic Complaints Questionnaire; and the trait part of Spielberger's State-Trait Anxiety Inventory). Before treatment, females reported greater present pain intensity than did males. Two years after treatment, females reported less sensory and emotional pain than at the initial stage; males presented no reduction in these pain scores. There were no gender differences at either stage regarding somatic complaints or anxiety level scores.*

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Investigations have shown that females outnumber males in seeking medical advice. It has been demonstrated that females of all ages from 10 years and older, with a peak for the age groups 20 to 29 and 70 to 79 years, sought medical advice more often than males.<sup>1</sup> There are probably many reasons for this, such as experiences that females have with the health system from pregnancy control and health care for children.

Pain is the most frequent symptom for seeking medical treatment.<sup>1</sup> A difference in sensitivity to pain could be a reason why females seek treatment more often than males. However, several pain-inducing experiments indicate that there is no agreement on gender difference regarding response to nociceptive stimuli.<sup>2-4</sup> Findings from a study investigating tactile sensory function suggest that males and females have tactile sensory functions that operate similarly, but that females and males consistently choose to use different numerical responses to the stimuli. The data support the view that environmental, cultural, and educational influences may be involved.<sup>5</sup> This may be the case when reporting qualities of pain as well.

As for somatic complaints, the most striking gender difference in seeking care is the need for medical help because of female genital diseases. If this reason for encounter is excluded, only minor gender differences remain. The most frequent single reason for seeking medi-



cal contact, irrespective of gender, is pain in the musculoskeletal system.<sup>1</sup> However, for the males, pain is mainly confined to the lower back; females' pain is usually restricted to the neck, the arms, and the shoulders.<sup>6</sup> Ergonomic load is found to be of greater significance for lower-back pain, and personality factors have been suggested to be contributing causes of muscle pain in the neck and shoulders.<sup>7</sup>

Research<sup>8</sup> has shown that the reporting and the perception of somatic complaints are closely connected to a personality factor such as negative affectivity (ie, anxiety and distress). It has been suggested that pain related to temporomandibular disorders (TMD) correlates with somatic complaints and anxiety.<sup>9</sup>

Temporomandibular disorders is regarded as a subgroup of general musculoskeletal disorders.<sup>10</sup> Based on clinical studies, these disorders occur more frequently in females than in males.<sup>11</sup> However, the overrepresentation of females in clinical TMD studies does not seem to be reflected to the same degree in clinical studies of general musculoskeletal disorders.<sup>1</sup> This is surprising if the first group really is a subgroup of the second.

The reasons that females outnumber males in clinical TMD studies are not clear.<sup>4</sup> One reason may be that females, in addition to general health awareness, experience the musculoskeletal disorders in the neck, the arms, and the shoulders, ie, areas in close proximity to the masticatory system.

Although females outnumber males in seeking TMD treatment, a fair number of males also need such treatment. However, few investigations concerning TMD pain, somatic complaints, and anxiety have focused on possible gender differences.<sup>12,13</sup> The authors of the present study think that a relationship has not been demonstrated between TMD pain, somatic complaints, and anxiety level among males and females suffering from TMD. Therefore, the aim of the present study was to assess the relationship between gender and TMD pain, somatic complaints, and anxiety level before and 2 years after conservative treatment in a group of patients with TMD.

## Materials and Methods

A total of 103 consecutive patients with TMD (79 females and 24 males, mean age 38 years) were referred to or applied for treatment at the Department of Prosthetic Dentistry and Stomatognathic Physiology, University of Oslo, Faculty of Dentistry, Oslo, Norway. The patients' case histories were recorded, and the patients were after-

ward subjected to routine methods of functional examination of the masticatory system.<sup>14</sup> The following diagnoses were used: myalgia; anterior disc displacement; arthritis; arthrosis; and pathologic attrition. The rationale for including this last diagnosis was that it was considered a disorder caused by mandibular dysfunction (muscle hyperactivity).<sup>15</sup> For eight patients, it was not possible to make a definite diagnosis. In addition to the clinical examination, the patients were asked to answer three questionnaires.

The first questionnaire was a Norwegian version of the McGill Pain Questionnaire (MPQ) used to assess the qualitative aspects of the patients' TMD-related pain.<sup>16,17</sup> In this questionnaire, pain is described by selecting adjective descriptions from 18 categories of sensory, affective, and evaluative pain. The affective and evaluative dimensions are combined and named *emotional pain*. A six-point scale, the Present Pain Intensity (PPI) included in the MPQ questionnaire, was used to quantify the degree of TMD pain reported.

The second questionnaire, the Somatic Complaints Questionnaire (SCQ), contains 27 items to assess the patients' somatic complaints.<sup>18,19</sup> The SCQ includes many types of symptoms, ie, muscle pain, cold/influenza, allergy, and intestinal and gastric problems. Two subscales were generated: (1) a muscle pain index comprising pain in the neck, the back, the arms, and the shoulders; and (2) a miscellaneous symptoms scale including all the other items except muscle pain.

The third questionnaire evaluated the patients' anxiety level using the trait part of Spielberger's State-Trait Anxiety Inventory (STAI).<sup>20</sup> The trait part was used to assess the patients' general mood. The state part tests the response to a particular situation such as an examination or a laboratory stress experiment.

All patients underwent the same type of treatment (counseling, muscle relaxation exercises, and splint therapy [Michigan type]) in the course of four visits. At the first visit, anamnestic data were collected, diagnostic evaluations were performed, counseling was given in accordance with the diagnosis given, and the patients were instructed in relaxation exercises for the jaw, neck, and shoulder musculature. Impressions and a jaw index to make a stabilization splint were taken. At the three following visits, the splint was adjusted and the carrying out of the exercises was controlled. At all visits the jaw, neck, and shoulder muscles were palpated, and the jaw movements were recorded.

After 2 years, the patients were again asked to answer the three questionnaires. At this stage of



**Table 1** Mean (SD) Scores of PPI, MPQ, SCQ, and STAI

	Sex	Control subjects (n = 35)	Patients with TMD	
			Dropout (n = 48)	Follow-up (n = 53)
PPI	F		3.5 (1.2)	3.1 (1.3)
	M		2.6 (1.1)	2.0 (1.1)
Sensory MPQ	F		23.6 (16.3)	20.1 (14.3)
	M		21.7 (19.1)	13.4 (9.4)
Emotional MPQ	F		14.6 (10.9)	12.3 (8.3)
	M		12.3 (12.6)	7.9 (4.8)
Muscle SCQ	F	0.8 (1.5)	4.8 (3.2)	4.8 (2.7)
	M	0.5 (0.8)	5.1 (3.6)	3.3 (3.6)
Miscellaneous SCQ	F	2.2 (2.3)	6.1 (5.0)	5.1 (4.2)
	M	1.5 (1.4)	6.0 (4.7)	5.3 (4.6)
STAI	F	33.7 (10.6)	41.3 (10.9)	41.5 (11.0)
	M	27.6 (6.7)	39.7 (14.4)	42.1 (16.6)

the investigation, 53 patients participated (40 females and 13 males). The data from these questionnaires were compared to the questionnaire answers of the patients who did not participate in the follow-up study. In addition, 35 patients who received conventional prosthodontic treatment at the department at the same time completed the SCQ and STAI questionnaires. These patients had no symptoms or signs of TMD, and they constituted the control group of the study. The patients who completed the questionnaires 2 years after treatment were analyzed further to evaluate possible gender differences with respect to frequency of pain in the neck and back and clinical diagnoses.

Mean values and 95% confidence intervals of the means of the PPI, MPQ, SCQ, and STAI scores were estimated and compared. Differences between the gender subgroups were assessed using the nonparametric Mann-Whitney *U* test. Differences between the initial scores and the scores after 2 years within the two gender groups were tested using two-sided paired *t* tests.

## Results

Table 1 presents the mean scores of PPI, MPQ, SCQ, and STAI in the control group (without TMD), the patient group with TMD who dropped out of the study, and the patient group who completed the questionnaires 2 years after treatment. The SCQ and STAI scores of the control group were significantly lower than those of the two TMD groups for both the male and female participants ( $P < .01$ ). No gender differences with respect to frequency of pain in the neck and back were recorded either before or 2 years after treatment.

The diagnoses of the patients are shown in Table 2. The majority of the diagnoses were classified as disorders of the masticatory muscles, which often were associated with other articular and nonarticular diagnoses.

The findings from the questionnaires are presented in Table 3. The PPI scores differed between the two gender groups before treatment ( $P = .01$ ) but were comparable at the posttreatment stage. The female participants showed improvement in the PPI scores at the 2-year posttreatment stage, but no improvement was recorded in the male group.

The sensory and emotional parts of the MPQ were similar in the two gender groups both before and 2 years after treatment. The female participants had improved at the 2-year posttreatment stage ( $P = .001$  and  $P = .1$ ) in contrast to the male group, in which no improvement was reported.

The SCQ scores focusing on muscle pain and miscellaneous symptoms, as well as the STAI scores, were similar in the two gender groups both before and 2 years after the treatment. No improvement was noticed in either group 2 years after treatment.

## Discussion

The mean age and the male-female ratio of the present study are on a level with those of other investigations.<sup>11</sup> At the follow-up stage, only 53 patients (40 females and 13 males) responded. Questionnaires were sent to only 96 individuals, since the remaining seven had entered the investigation so late that 2 years since treatment had not yet elapsed. Because of missing data, two people



**Table 2** Diagnoses of the Patients Who Completed Follow-up Questionnaires and of the Dropout Patients

	Follow-up (n = 53)		Dropout (n = 49)	
	Females	Males	Females	Males
Myalgia	10*	2	11	5
Myalgia + anterior disc displacement	12†	2	9†	
Myalgia + arthrosis	4	1	3	1
Myalgia + arthritis	1‡		1	
Myalgia + pathologic attrition			2	
Myalgia + arthrosis + arthritis	2			
Myalgia + anterior disc displacement + pathologic attrition		1		
Anterior disc displacement	5	4	2	1
Anterior disc dislocation + arthrosis		1		
Anterior disc dislocation + arthritis				1
Anterior disc dislocation + pathologic attrition			2	
Arthrosis	2		2	
Arthritis	1			
Pathologic attrition	1	1		1
Unknown	2	1	6	2
Total	40	13	38	11

\*One patient with whiplash.

†One patient with whiplash, one with fibromyalgia.

‡One patient with fibromyalgia.

**Table 3** Mean Scores and 95% Confidence Intervals of Male and Female Patients Before and 2 Years After Treatment\*

	Females (n = 40)		Males (n = 13)	
	Initial	2 years	Initial	2 years
Present Pain Intensity	3.1 (2.7–3.5)	2.2 (1.7–2.7)	2.0 (1.3–2.7)	2.3 (1.6–3.1)
	$P = .001$		$P = .28$	
	$P = .01$		$P = .95$	
Sensory TMD pain (MPQ)	20.1 (15.6–24.7)	11.9 (7.9–15.9)	13.4 (7.7–19.1)	14.7 (4.5–24.9)
	$P = .001$		$P = .72$	
	$P = .17$		$P = .61$	
Emotional TMD pain (MPQ)	12.3 (9.6–14.9)	7.7 (5.0–10.5)	7.9 (5.0–10.9)	8.9 (2.3–15.6)
	$P = .01$		$P = .83$	
	$P = .09$		$P = .84$	
General muscle pain (SCQ)	4.8 (3.9–5.8)	4.6 (3.5–5.6)	3.3 (1.1–5.5)	2.7 (1.0–4.3)
	$P = .81$		$P = .79$	
	$P = .07$		$P = .07$	
Miscellaneous symptoms (SCQ)	5.1 (3.6–6.6)	5.2 (3.7–6.7)	5.3 (2.5–8.1)	4.7 (1.0–8.3)
	$P = .66$		$P = .74$	
	$P = .87$		$P = .43$	
Spielberger trait anxiety (STAI)	41.5 (37.7–45.3)	38.7 (34.7–42.7)	42.1 (32.0–52.1)	36.2 (26.8–45.7)
	$P = .07$		$P = .09$	
	$P = .89$		$P = .26$	

\*P values are based on two-tailed paired *t* tests within groups, and on the Mann-Whitney *U* test between groups.



had to be excluded. Fifteen questionnaires were returned labeled "address unknown." New addresses were obtained for 14 individuals, but recalls did not result in more answers. This demonstrates the difficulties involved in obtaining replies to this kind of questionnaire a second time. It is uncertain how the low response rate may have influenced the findings. However, Table 1 shows that the PPI, MPQ, SCQ, and STAI values in the dropout patient group were comparable to those of the patients who completed the second set of questionnaires. An exception was a higher dropout rate of male patients with high MPQ scores. The difference failed to reach a statistical level of significance, possibly because of the low number of study participants.

The reliability of the MPQ has been tested by Love et al,<sup>21</sup> who found strong test-retest reliability coefficients for the MPQ pain rating indexes as well as for some of the other categories. The validity of the three-dimensional framework of the MPQ has also been reviewed and found acceptable.<sup>22</sup> The distinction between sensory and affective dimensions is accepted, but there is still debate about the rationale of separating the affective and evaluative dimensions.<sup>23</sup> The somatic complaints were assessed by means of a health questionnaire. The validity and reliability have been discussed and found satisfactory.<sup>18,19</sup> Spielberger's STAI has been used in various contexts and has been found to have acceptable reliability and validity.<sup>24</sup>

At the initial stage, the reporting of PPI was the main difference between the two gender groups. Pullinger and Monteiro,<sup>25</sup> in a study of TMD patients, also found females to report more severe symptoms than did males. This may be because of differences in pain culture rather than differences in tolerance to pain. It is more accepted for females to report pain.<sup>26</sup> As earlier mentioned, females seek treatment more often than do males and are consequently more familiar with pain reporting. Furthermore, it has been suggested that females are more intimate with the patient role than are males.<sup>27</sup> The patient role includes subordination and dependence and may imply a threat to males' masculine identity, thus causing underreporting by them. Females' feminine identity is less threatened by the patient role. The possibility that females are more sensitive detectors of pain has also been mentioned as an explanation of gender differences on this topic.<sup>4</sup>

There were no differences between the gender groups at either stage concerning sensory and emotional TMD-related pain. This is in contrast to the findings of Bush et al,<sup>4</sup> who found higher scores

among females with chronic pain compared to males with chronic pain on the sensory dimension of the MPQ.

Two years after treatment, the females reported less present pain intensity and sensory and emotional pain than at the initial stage. There were no differences reported by the males, however. Therefore, in the present study, the treatment outcome, based on the PPI and MPQ scores, was better for the females than for the males. Whether this gender difference is found for other illnesses is not known. De Leeuw et al<sup>28</sup> did not find any gender differences regarding treatment outcome in a TMD group, but the treatment given in their study was only a stabilization splint. In the present study, an additional aspect was, above all, to listen to the patient to make him or her feel safe in the therapeutic situation. Perhaps females are more receptive than males to such a psychologic approach. Since females seek help more easily, they may also be more willing to receive help. It is not known whether the females' response is merely a pain response or whether females really have a better response to the treatment given. Oakley et al<sup>29</sup> suggest that reduction of pain may be explained as a shift in the personal importance of pain rather than the current level of actual nociception. Also, the small sample size in our study could explain the lack of difference in pain description from start until 2 years after treatment found in the male group. This assumption is strengthened by the fact that the males who dropped out were those with a high initial MPQ score. On the other hand, the PPI and the MPQ scores of the females at 2 years after treatment are approximately the same as the pretreatment and posttreatment scores of males. It seems as though the males had little pain to "lose," and that the females who started by reporting a higher pain intensity could improve, but only to a certain level.

A number of investigations have demonstrated that about 75% to 80% of patients suffering from TMD will improve as a result of reversible, conservative types of treatment.<sup>30</sup> The question is, based on the results from the present study, if the males are to be found in the 25% group, who does not improve? On the other hand, chronic pain prevails among females. Perhaps the use of adjectives to rate pain and discomfort via MPQ is unrealistic and unfamiliar for males. Moreover, measures focused on the main symptoms of TMD could be a better tool than MPQ in evaluating treatment outcome among males and females.<sup>13</sup>

There was no gender difference when general muscle pain and miscellaneous symptoms were



reported at any stage, only a tendency for females to report more muscle pain than males. Hagberg et al<sup>31</sup> conducted a study of patients with TMD; the odds ratio calculations suggested that female patients compared to male patients have an increased "relative risk" of reporting general musculoskeletal pain. De Leeuw et al<sup>28</sup> also found females to report more general health symptoms and more locations in the head, neck, and shoulders that were tender or painful than did males. The last finding corroborates recordings from patients seeking help for general medical reasons.<sup>6</sup>

Before treatment, our hypothesis was that the treatment using counseling, muscle exercises, and a stabilization splint would entail a general relaxation with a positive effect on general muscle pain and especially on the neck and shoulder muscles. This was because the muscle exercises in addition to the chewing muscles were aimed at the neck and shoulder muscles. However, neither group reported reduction of general muscle pain and miscellaneous symptoms.

The anxiety level was nearly identical in the two groups. The patient group may be characterized as mildly distressed; their anxiety score was on a level with that of general medical and surgical patients.<sup>20</sup> The anxiety scores were, however, lower in the control group (see Table 1). This observation strengthens the suggestion that anxiety is related to TMD.<sup>9</sup> In the general population, the level of anxiety is only slightly higher in females than in males.<sup>20</sup> However, it was found that males suffering from TMD differ from a population group both in reporting conflicting psychologic demands at work and in having sleep disturbances.<sup>31</sup> It is possible that these factors are part of the reasons that anxiety levels in males with TMD are in line with those of females with TMD.

The TMD treatment had no effect on the anxiety level in either group. There was only a slight tendency in both groups to report less after 2 years. Thus, the treatment did not seem to have any effect on the psychic behavior of the patients because their moods did not improve. This was not a totally unexpected finding, since this trait level is rather stable in adults,<sup>20</sup> and since other types of treatment (eg, a cognitive-behavioral treatment) have been shown to have a greater impact on anxiety levels than the treatment given in the present study.<sup>29</sup> A cognitive behavioral treatment encompasses several stress-management procedures and is considered more comprehensive than counseling.

On the other hand, in a study by Krogstad et al<sup>12</sup> dealing with two different groups of patients with TMD, one with high headache and muscle

palpation scores and the other with low/medium scores, it was found that the anxiety scores after conservative TMD treatment decreased in the low/medium-score group. There was no change in the high-score group. The question is whether a high level of trait anxiety constitutes a risk factor for symptom relapses. On the other hand, few relapses after treatment of TMD have been reported.<sup>32</sup> Maybe their sufferings are converted into other psychosomatic complaints instead. This, of course, is a field that needs further medical and psychologic elucidation.

## Conclusion

In the present study, the females were found to report greater present pain intensity at the pre-treatment stage than did the males. Because of the small sample size caused by the large number of dropouts, further investigations are needed to elucidate the findings of positive treatment outcome of the female patients and negative treatment outcome of the males. Different tools to evaluate treatment outcome should be used, and the findings should be compared.

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## Resumen

El Reporte del Dolor, Quejas Somáticas y Ansiedad en un Grupo de Pacientes con Desórdenes Temporomandibulares Antes y Después de dos Años de Tratamiento: Diferencias en el Género de los Participantes

El propósito de este estudio fue el de evaluar posibles diferencias en el género de los participantes en cuanto al dolor, quejas somáticas y ansiedad en un grupo de pacientes que sufrían de desórdenes temporomandibulares (DTM). El grupo consistió de 40 mujeres y 13 hombres que recibieron tratamiento conservador para sus DTM, el cual incluía asesoramiento, ejercicios musculares, y estabilización de las férulas. Antes y después de los dos años de tratamiento, los pacientes respondieron tres cuestionarios (cuestionario de McGill [versión noruega], que incluía una escala de seis puntos, la intensidad del dolor presente, un cuestionario de quejas somáticas; y la sección de rasgos del inventario de ansiedad de Spielberger. Antes del tratamiento, las mujeres reportaron más dolor presente que los hombres. Dos años después del tratamiento, las mujeres reportaron menos dolor emocional y sensorial que en el estado inicial; los hombres no presentaron reducción en los registros de dolor. No se presentaron diferencias entre los géneros en ningún estado en cuanto a las quejas somáticas y los registros del nivel de ansiedad.

## Zusammenfassung

Wie Myoarthropathie-Patienten über Schmerz, somatische Beschwerden und Besorgnis vor und 2 Jahre nach Behandlung berichten: Geschlechtsunterschiede

Das Ziel dieser Studie war die Beurteilung möglicher Geschlechtsunterschiede bezüglich der Schilderung von Schmerz, somatischen Beschwerden und Besorgnis bei einer Gruppe von Patienten mit Myoarthropathien (MAP). Die Gruppe bestand aus 40 Frauen und 13 Männern, welche konservativ behandelt wurden (Beratung, Muskelübungen, Stabilisationschiene). Vor und 2 Jahre nach der Behandlung beantworteten die Patienten drei Fragebogen (McGill Pain Questionnaire [Norwegische Version], beinhaltend eine Sechs-Punkte-Skala und die momentane Schmerzintensität, einen Fragebogen über somatische Beschwerden und den zweiten Teil des "Spielberger's State-Trait Anxiety Inventory"). Vor der Behandlung berichteten Frauen über grösseren momentanen Schmerz als Männer. Zwei Jahre nach Behandlung berichteten Frauen über weniger sensorischen und emotionalen Schmerz als am Anfang; Männer zeigten keine Verringerung bei diesen Angaben. Es gab keine Geschlechtsunterschiede zu jedem Zeitpunkt bezüglich somatischer Beschwerden oder Grad der Besorgnis.