

Routine Dental Care in Patients with Temporomandibular Disorders

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Aims: While a significant number of therapeutic models have been suggested for management of orofacial pain and limited opening in patients experiencing temporomandibular disorders (TMD), little attention has been given to the issue of routine daily care activities, such as toothbrushing and flossing. The purpose of this study was to develop an understanding of the extent to which TMD patients experience difficulty in performing routine daily mouth care. **Methods:** Forty patients seeking care for TMD in the Orofacial Pain Center at the University of Kentucky College of Dentistry were age- and gender-matched to a group of general dentistry patients not experiencing TMD. Participants completed a survey of oral health habits, and a clinical exam. **Results:** Results indicated that TMD patients felt their discomfort had created more difficulty with daily mouth care as compared with the general dentistry patients ($P < .000$). Most TMD patients, however, continued with routine daily mouth care, except for 15% who reported an inability to floss on a regular basis. Also, a majority of TMD patients (63%) reported a change in seeking routine professional care because of their disorder ($P < .000$). **Conclusion:** The present data indicate the need for TMD patients to receive information concerning routine daily mouth care and visits for professional dental care. The results are discussed in terms of the strategies that dental care providers need to develop in order to address the significant consequences of orofacial pain on regular dental care.

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Key words: temporomandibular disorders, daily mouth care, toothbrushing/flossing, routine professional care, patient pain/difficulty perception

Patients who demonstrate signs and symptoms of temporomandibular disorders (TMD) can exhibit a number of clinical problems that involve the muscles of mastication and/or the temporomandibular joint (TMJ) and associated structures.¹ Cross-sectional epidemiological studies show that these signs and symptoms are quite prevalent among the adult population with 40% to 75% of persons demonstrating at least 1 sign (movement abnormalities, joint sound, etc), and about 33% describing at least 1 symptom (face pain, joint pain).²⁻⁵ It is estimated, however, that only between 4% and 7% of the population are in need of treatment. Of this patient group, a predominance (> 80%) are women between the ages of 20 and 40 years, having a mean age of 33 years.⁶

Although TMD are often remitting and self-limiting, the symptoms can fluctuate over time. Whether episodic or persistent, clini-

cal experience indicates that TMD patients often present with limited opening and varying degrees of pain. It has been reported that problematic mouth-opening limitations occur in nearly 5% of the population.⁴⁻⁷ As a result, the dental management of the patient with limited mouth opening presents a challenge for oral health providers. Quite frequently, these patients will express to the clinician that the pain and limitations create problems and difficulty with daily home care, as well as with receiving routine professional dental care.

While a significant number of therapeutic models have been suggested for the management of orofacial pain and limited opening, we could not identify any clinical studies that have focused on the management of routine home and professional care in the presence of TMD. The purpose of this research was to evaluate TMD patients, perceptions of their difficulty in performing routine daily mouth care.

This paper has not been presented in its entirety to any organized group. It was presented as a poster abstract to the American Association of Dental Schools Annual Session on April 4, 2000, in Washington, DC.

Materials and Methods

Participants

Forty patients seeking care at the University of Kentucky College of Dentistry in the Orofacial Pain Center were asked to complete a questionnaire. Patient selection was very carefully made to include only patients presenting with TMD with painful joint involvement and/or limited opening. Those patients with facial pain not involving limited opening or joint pain were excluded from the study. Forty age- and gender-matched general dentistry patients served as controls. The control group consisted of adults who reported no TMD symptoms involving pain and/or limited opening.

Procedure

The Medical Institutional Review Board of the University of Kentucky approved the design of the study and the survey instruments. Questionnaires were distributed during the initial clinical interviews in the Orofacial Pain Center. Forty age- and gender-matched controls from the University of Kentucky College of Dentistry were also given the same survey instrument. Information sought included relative perceived amounts of recent and

current TMD pain, and degree of difficulty and amount of change that the TMD discomfort has made in performing different facets of basic daily mouth care. Questions were also directed toward an understanding of the patients' perceptions of the effect of TMD in seeking routine professional dental care. These questions were followed by an inquiry into TMD patients' interest in seeking professional care and instruction in daily home care through the use of a protocol specifically developed for TMD patients. A visual analog scale (VAS), ranging from 1- to 10- cm increments, was used to record subjective responses.⁸⁻⁹ A final portion of the research involved recording patient data, such as age, gender, and educational level. Additionally, mandibular range of movement data were measured and recorded during the clinical examination. An attending dentist or residents of the Orofacial Pain Center collected all data on the survey instruments for the TMD patient group. The same attending dentist collected data for all patients in the control group. The attending dentist and all residents had been previously calibrated for data collection in clinical examinations.

Statistical Analysis

Statistical analysis of the data included *t* test analysis of the questions answered on the VAS as interval level responses, and chi-square analysis of the questions representing a nominal level of measurement. The alpha level was set at $P < .05$.

Results

Results of the survey were organized into 5 different domains, including Demographic Characteristics, Pain and Dysfunction, Self-care Activities, Professional Care, and Mandibular Range of Movement. The demographic characteristics of patients presenting with TMD are presented in Table 1. The limitation of dexterity was the only TMD patient characteristic differentiating that group from the general dentistry controls ($\chi^2 = 7.314, P = .07$).

In order to distinguish between the TMD and control groups, pain and dysfunction variables were obtained. The VAS results indicated that the intensity of pain perceived by TMD patients in the previous month was 5.97 cm (SD \pm 2.71), and at the time of the questionnaire was 4.58 cm (SD \pm 3.04). Corresponding controls reported a mean of 0.18 cm (SD \pm 0.74) jaw pain experienced in the last month, and a mean of 0.02 cm jaw pain at the

Table 1 Demographic Characteristics

	TMD group	Control group
Age*	33.85 (\pm 10.9159)	33.175 (\pm 9.9843)
Gender		
Female	85%	82.5%
Male	15%	17.5%
Education level		
HS not completed	15%	15.3%
HS completed	45%	46.15%
College completed	32.5%	23.07%
Graduate level	7.5%	3.22%
Dexterity limitation	22.5%	2.5%
Handedness		
Left	13.15%	15.78%
Right	86.84%	84.2%

*Years (SD); HS = high school.

time of the survey. The average level of jaw pain experienced over the month preceding treatment and the current level of pain when seeking treatment were all significantly different from the control group ($P < .000$).

All data pertaining to oral self-care activities are presented in Table 2. The results indicated that TMD patients felt that their discomfort had created more difficulty in performing basic daily mouth care on average as compared to the control group ($P < .000$). TMD patients also indicated general difficulty brushing their teeth due to the presence of the pain and or limited opening than did controls. The type of toothbrush used was not a significant factor for either group ($P > .05$). When using a toothbrush on different surfaces of the teeth, TMD patients expressed greater difficulty with cheek-side, tongue-side, and top-side or occlusal care than the control group.

Flossing also presented problems for the patient group as compared to the controls. Eighty-five percent of the TMD group continued to floss in the presence of their TMD, although it was reported as difficult. Only 15% of the TMD group reported not being able to floss. All controls (100%) responded that they were able to floss. Only the TMD patients responded to questions concerning the perception of the amount of change that the TMD condition had made in performing daily mouth care. Approximately 50% of the TMD patients answering these questions reported that their performance of daily mouth care had indeed changed since the development of the TMD.

The results of patients' perception of the effect of TMD on seeking routine professional dental

care are reported in Table 3. There was a substantial number of patients seeking care for TMD pain and/or limited opening who reported that dental office appointments were unpleasant because of jaw pain or limited opening, while only 5.1% of the control group expressed the same problem. The average degree of effect of TMD pain on receiving professional care expressed by the TMD patients was predictably greater than controls as well. When queried about regular dental visits in the past, there were no differences between the groups.

The relationship of TMD and related jaw pain to continuing to seek routine professional care was also explained. Over 63% of the TMD patients reported that the lack of continuance in seeking regular professional care was related to the TMD pain, while none of the controls answering this question felt that TMD pain had contributed to their lack of regularity in professional dental care.

The interest level of both the TMD patient group and the controls regarding the receipt of professional care especially managed for TMD pain, and homecare instructions especially for patients with TMD complications were examined. For professional care managed with a special protocol for TMD pain and/or limited opening, the TMD group expressed much greater interest than controls. For brushing and flossing instructions targeted toward easing the discomfort of TMD pain, the TMD group reported a greater interest level than the control group.

Mandibular range of movement data are compiled in Table 4. The standardized measurements were made and recorded by an attending dentist

Table 2 Self-care Activities

Question	TMD group	Control group	Statistical result	Level of significance
Amount of difficulty that jaw pain or limited opening creates in basic daily mouth care	Mean 4.5900 (SD 2.6620)	Mean 0.0275 (SD 0.1339)	$t(78) = 10.826$	$P < .000$
Difficult to use toothbrush due to limited opening or jaw pain?	Y = 25 N = 15	Y = 0 N = 40	$\chi^2 = 36.364$	$P < .05$
Type of toothbrush used	M = 38 E = 2	M = 38 E = 1	$\chi^2 = .321$	$P > .05$
Amount of difficulty brushing cheek-side of teeth	Mean 3.6448 (SD 2.8330)	Mean 0.016 (SD .08000)	$t(52) = 6.394$	$P < .000$
Amount of difficulty brushing tongue-side of teeth	Mean 3.2172 (SD 2.7550)	Mean 0.02963 (SD 0.1068)	$t(54) = 6.004$	$P < .000$
Amount of difficulty brushing chewing surface of teeth	Mean 3.9967 (SD 2.9305)	Mean 0.1481 (SD 0.6369)	$t(55) = 6.678$	$P < .000$
Ability to use floss?	Y = 34 N = 6	Y = 40 N = 0	$\chi^2 = 6.486$	$P < .05$
Amount of difficulty in flossing	Mean 3.7844 (SD 2.8448)	Mean 0.3949 (SD 0.8463)	$t(69) = 7.078$	$P < .000$
Change in ability to care for mouth since developing TMD?	Y = 24 N = 12	Subjects had no TMD	$\chi^2 = 4.00$	$P < .05$ for TMD patients only
Amount of change TMD has made on daily mouth care	Mean 4.6125 (SD 2.6879)	Mean .000 Subjects had no TMD	$t(23) = 1.681$	$P > .05$ ($P = .106$)

Y = Yes; N = No.
M = manual; E = electric.

and residents in the UK Orofacial Pain Center at the time the surveys were given to the patients. Identical standardized measurements were taken and recorded by the same attending dentist on all controls. Comparisons of the 2 groups for average mandibular range of movement are presented in Table 4. These results indicate that, except for all the protrusive excursion measurements, all the mandibular range of movement means of the TMD group were significantly different from the controls.

Discussion

This study was designed to document patient perceptions of pain related to dental home care and routine professional care in the presence of TMD with pain and/or limited opening. Many patients

express difficulty with home care or routine professional care due to TMD involvement to their individual dental professional, but few, if any, studies have obtained baseline information on this topic.

The quality of data collection was consistent during the entire length of this study. The University of Kentucky Orofacial Pain Center attending dentist and residents involved in the study had been previously calibrated in standardized clinical data collection techniques. The important findings of the study were that patients exhibiting symptoms of TMD with pain and/or limited opening do indeed have difficulty in performing daily mouth care. It was found that TMD patients perceive changes in their ability to perform daily mouth care do occur after the development of TMD symptoms. Also documented was the fact that patients report routine professional

Table 3 Professional Care

Question	TMD group	Control group	Statistical result	Level of significance
Professional visits unpleasant because of jaw pain?	Y = 29 N = 11	Y = 2 N = 37	$\chi^2 = 37.593$	$P < .000$
Amount of effect TMD has on receiving professional care	Mean 5.8400 (SD 2.3567)	Mean 0.7667 (SD 1.3367)	$t(34) = 5.073$	$P < .000$
Regular visits in past?	Y = 33 N = 7	Y = 25 N = 14	$\chi^2 = 3.425$	$P > .06$
Currently continuing regular dental visits?	Y = 24 N = 10	Y = 24 N = 3	$\chi^2 = 3.006$	$P > .08$
If no, related to jaw pain?	Y = 12 N = 7	Y = 0 N = 7	$\chi^2 = 14.641$	$P < .000$
Amount of interest in professional care managed especially for TMD patients	Mean 7.5103 (SD 2.3582)	Mean 1.2889 (SD 3.2579)	$t(36) = 6.307$	$P < .000$
Amount of interest in homecare methods developed especially for TMD patients	Mean 7.4323 (SD 2.8301)	Mean 2.6900 (SD 3.7456)	$t(39) = 4.253$	$P < .000$

Y = Yes; N = No.

Table 4 Mandibular Range of Movement

Question	TMD*	Control*	Statistical result	Level of significance
Maximum opening	30.2750 (9.8136)	47.1750 (6.3846)	$t(78) = -9.129$	$P < .000$
Passive stretch	35.8750 (9.8948)	50.4000 (6.2831)	$t(78) = -7.838$	$P < .000$
Right lateral excursion	8.1000 (2.5998)	10.5000 (2.3751)	$t(78) = -4.311$	$P < .000$
Left lateral excursion	8.1500 (2.9049)	10.9000 (2.0976)	$t(78) = -4.854$	$P < .000$
Protrusive excursion	6.4500 (2.2977)	7.1000 (2.0229)	$t(78) = -1.343$	$P > .05$ ($P = .183$)

*Mean (SD).

dental visits to be uncomfortable in the presence of TMD symptoms. Nevertheless, it was found that most TMD patients continue to seek routine dental treatment in spite of their disorder. The data also indicate TMD patients are highly interested in receiving information on homecare methods developed with consideration for the complications of their disorder. Finally, it was shown that TMD patients report they are highly interested in receiving routine professional dental care managed especially for their dysfunction and pain.

Based on patients' responses to this study, various strategies could be developed by dental care

providers to address the significant consequences of orofacial pain on routine dental care. These approaches need to include the management of dysfunction and pain encountered during home care, as well as professional dental care. A range of recommendations for specific types of daily mechanical and chemical plaque control measures should be established, offering options based on individual pain and TMD involvement, as well as diagnosed oral care needs. These might include dental care procedures, special management protocols including the use of preemptive medications, such as nonsteroidal anti-inflammatory drugs or

mild muscle relaxants, followed by appropriate post-procedure medication and pain management exercise techniques.

The age ranges and gender distribution were found in the present study to be reflective of epidemiological patterns of TMD involvement typically reported in the literature,⁶ with a fairly even distribution of ages and predominance for female patients. The only patient characteristic that was statistically different from the control group was limitation of dexterity. Although this condition is not likely to be directly related to TMD, it should be considered when making homecare recommendations to TMD patients who have dexterity limitations.

In conclusion, the results of this study confirm what clinicians hear frequently from patients who have TMD pain with or without limited opening—that the limitations of this disorder make it difficult for patients to continue with daily mouth care at home and to continue with routine professional care. Results of the study suggest that there is significant difficulty in brushing and flossing related to TMD, and it does have an effect on patients with this disorder in continuing with routine professional dental care. The characteristics of the patient population in this study are consistent with established norms for patients with TMD discomfort.¹⁰ Mandibular range of movement measurements confirmed the presence of the disorder, and were reflective of that in the established literature. Recommendations made from the outcome of this study point out the need for research-based protocols for daily mouth care regimens, particularly in the area of marketed mechanical plaque control devices. Also, it is recommended that a protocol be developed for routine professional care of TMD patients, with emphasis on length of appointments, pain management techniques including exercises pre- and post-appointment, and potential use of analgesics and/or narcotics.

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