Dietary Fiber Intake in Patients with Myofascial Face Pain

Karen G. Raphael, PhD
Associate Professor
University of Medicine and Dentistry of NJ
NJ Medical School: Dept. of Psychiatry
NJ Dental School: Dept. of Oral Pathology, Biology, and Diagnostic Sciences
30 Bergen Street ADMC 14
Newark, NJ 07107
USA

Joseph J. Marbach, DDS
Robert and Susan Carmel Professor in Algesiology
University of Medicine and Dentistry of NJ
NJ Dental School: Dept. of Oral Pathology, Biology, and Diagnostic Sciences
NJ Medical School: Dept. of Psychiatry
183 South Orange Avenue
UBSB Room F1512
Newark, NJ 07103
USA

Riva Touger-Decker, PhD, RD, FADA
Associate Professor and Program Director
University of Medicine and Dentistry of NJ
School of Health Related Professions: MS in Clinical Nutrition
NJ Dental School: Dept. of Oral Pathology, Biology, and Diagnostic Sciences
65 Bergen Street, Room 158
Newark, NJ 07107
USA

Correspondence to:
Karen G. Raphael
University of Medicine and Dentistry of NJ
NJ Medical School: Dept. of Psychiatry
NJ Dental School: Dept. of Oral Pathology, Biology, and Diagnostic Sciences
183 South Orange Avenue
UBSB Room F1512
Newark, NJ 07103
USA
Fax: (973) 972-8305
E-mail: raphaekg@umdnj.edu

Aims: *To determine the impact of myofascial face pain (MFP) on dietary intake of selected nutrients.* ***Methods:*** *Sixty-one MFP women meeting the criteria for the myofascial subtype of temporomandibular disorders completed a 4-day daily food intake diary, as well as self-report of pain severity, pain interference with eating, and depressive symptomatology. Nutrient intake for the MFP women was compared with a demographically-equivalent sample of community women participating in the federally-sponsored Continuing Survey of Food Intakes by Individuals (CFSII). Within the MFP sample, multiple linear regression analysis was used to test whether dietary fiber intake reduction was most likely due to pain adaptation, or to depressive symptomatology or associated appetite reduction.* ***Results:*** *Only the subgroup of MFP patients with above-average pain severity showed reduced dietary fiber intake compared with the community sample. MFP patients did not differ from the community sample on other nutrient intake measures (ie, total calories, protein, fat, carbohydrates and dietary fiber, calcium, and iron). Within the MFP sample, pain severity was significantly associated with reduced dietary fiber intake. This relationship persisted, after controlling for depressive symptomatology, appetite, and total calories.* ***Conclusion:*** *Myofascial face pain patients with more severe pain intensity are likely to reduce their intake of dietary fiber. This is likely due to an effort to decrease masticatory activity to avoid exacerbating facial pain. Since low dietary fiber, especially in combination with commonly prescribed medications for MFP, increases the risk of constipation and may exacerbate comorbid medical conditions, clinicians should recommend alternative dietary fiber sources for MFP patients.*
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Key words: myofascial face pain, temporomandibular disorders, quality of life, pain, nutrition

Relatively little attention has been focused on the impact of myofascial face pain (MFP) on patients' quality of life, although there are exceptions.[1–4] The literature studying quality of life in MFP patients largely focuses on psychological impairment.[5–8] These studies typically document the comorbidity of MFP with various psychological symptoms and syndromes. Ambiguity about the directionality of the relationship has not been firmly resolved,[9] although recent research[10] indicates that, at least in the case of a major depressive disorder (MDD), psychological status is more likely to be a consequence than a cause of MFP.

Information on other aspects of quality of life in MFP patients is more limited. Two reports suggest that a common functional interference in MFP is difficulty in chewing foods.[3,4] These 2 studies focused solely on their subjects' self-report of such a problem. Although these self-reports lead to speculation[4] that MFP patients may find it difficult to meet current nutritional guidelines, no studies to date have examined the overall diet of those with MFP. Is it possible that MFP patients persist in consuming their usual diet, despite masticatory muscle pain and consequent chewing difficulty, or does the intensity of pain alter the quantity and quality of one's diet?

Others have speculated that if TMD pain patients alter their diet to choose softer foods, subclinical nutritional deficiencies may compound mandibular dysfunction by impairing the ability of connective tissues to heal,[11] and may contribute to comorbid conditions such as depression.[12] It has also been proposed that nutritional problems may be a contributor to temporomandibular joint (TMJ) dysfunction.[13] Regardless of the validity of these speculations, documenting whether MFP patients alter their diet would enhance our understanding of the impact of MFP on quality of life.

There are multiple reasons to hypothesize that the MFP would lead to dietary change.

The "pain adaptation" model of Lund and colleagues[14] may serve to generate hypotheses. As originally proposed, this model predicts that MFP sufferers alter their masticatory activity patterns to protect painful muscles. A generalized extension of such a model would predict that patients modify their diet because, simply put, it hurts to chew certain foods. In particular, this model would hypothesize that nutrient intake might be affected by avoidance of foods that require considerable mastication, such as fiber rich and chewy foods.

Studies of both experimentally induced masticatory muscle pain and of MFP patients have shown that painful masticatory muscles exert less force and fatigue more quickly than nonpainful muscles.[14–17] Similarly, Dao et al[18] have shown that 3 minutes of chewing casting wax can raise pain severity scores by more than 50% in MFP patients. A model of pain adaptation would hypothesize that dietary fiber content, as a standard dietary factor related to food hardness or chewiness, would be reduced among MFP cases as a function of pain intensity.

An alternative model predicting dietary change in MFP draws upon the consistent finding that levels of depressive symptomatology and major depressive disorder are elevated among patients with MFP.[5–8] One of the neurovegetative signs of depression is anorexia. Thus, an alternative explanation for lower fiber content in the diets of MFP patients is not related to pain adaptation. Instead, the model posits that depression associated with MFP leads to reduced dietary fiber intake as part of overall caloric reduction. This alternate model would predict that the relationship between dietary fiber and pain—predicted as well by a pain adaptation model—would be mediated by the relationship between pain and depressive symptoms, and/or overall caloric intake levels or self-reported loss of appetite. The alternate model would predict that, after accounting for factors such as overall caloric intake, depressive symptomatology, and reduced appetite, the relationship between pain and dietary fiber would no longer be significant.

The aims of the current investigation were to (1) determine whether MFP patients' diets differ from those of demographically similar women in the general population; (2) replicate and extend findings from earlier research suggesting that MFP patients' diets reflect a response to pain in which dietary fiber intake is reduced; and (3) test whether any nutrient intake difference is likely to be a function of pain adaptation or of psychological factors associated with reduced appetite and overall caloric reduction. The current investigation pursues these aims in the context of a study in which MFP subjects maintained a diet diary for 4 consecutive days and recorded their pain severity and psychological status.

Materials and Methods

Subjects. Myofascial pain subjects consisted of patients attending an orofacial pain treatment service at the Oral Medicine Clinic at the University of Medicine and Dentistry of New Jersey/New Jersey Dental School. In addition to recruiting new referrals, the clinic received referrals from dentists in the local community, following a mailing announcing the study's commencement. All referred female patients received a comprehensive evaluation, including examination for temporomandibular disorders (TMD).

Participating MFP patients met criteria for the myofascial subtype of TMD according to the Research Diagnostic Criteria (RDC)[19] in which a facial pain complaint was associated with localized tenderness to palpation at 3 or more of 20 muscle sites. In a modification of the RDC, those prospective subjects whose pain was expressed solely intraorally (ie, no extraoral sites) were excluded from the study. Patients meeting criteria for other TMD such as osteoarthritis (OA) of the TMJ were not automatically excluded, providing that their chief complaint was pain (as opposed to clicking or symptoms associated with OA such as crepitus or primarily intraarticular pain). For a potential subject with additional comorbid TMD conditions to be deemed eligible, a clinical judgment must have been made that the chief complaint was myofascial pain.

Three clinicians were trained to conduct orofacial examinations according to the RDC.[19] Periodic reliability examinations were conducted throughout the study. Perfect agreement was achieved at the diagnostic level regarding the presence or absence of a diagnosis of myofascial face pain (Kappa = 1.0 across 27 reliability examinations; correlation of tender point counts among examiner pairs, r = .89).

Only women were enrolled, giving evidence that prevalence rates of MFP, especially among those seeking treatment, are much higher among women than men.[20–22] Subjects were required to be fluent in English. For other study purposes not relevant here,[23] they could not: *(a)* have been treated with an oral appliance for facial pain or purported bruxism; *(b)* have less than 6 maxillary and 6 mandibular posterior natural teeth that occluded; or *(c)* have a removable partial denture. In addition, they could not currently have fixed orthodontic appliances in place.

Sixty-eight women were enrolled and 61 completed all relevant phases of the investigation. The average age of the completers was 34.0 (SD = 10.9). Their average number of years of education was 14.4 years (SD = 2.2), equivalent to 2 years of college. Seventy-seven percent of the women self-identified their race as white. Most (72%) had sought professional treatment for their facial pain prior to study participation. Average pain level in the 6 months prior to the start of the study was 5.5 (SD = 1.7), assessed on a 0 to 10 pain intensity scale.

Data from the Continuing Survey of Food Intakes by Individuals (CFSII) (1994–1996), conducted by the U.S. Department of Agriculture, were used to provide comparable information on nutrition from a general population sample. The CSFII selects a stratified multistage probability sample, in order to produce nationally representative nutrition data for the civilian, noninstitutionalized United States population. In order to produce a general population subsample as comparable as possible to the sample of MFP patients, women participating in the CSFII who were between the ages of 20 to 60 and residing in the Northeast region of the United States were selected. The resulting sample of 1,657 women was 79.4% (n = 1,315) white. Their average age was 41.39 (SD = 10.90), with an average of 14.62 (SD = 10.30) years of education.

Measures

Diet Diary. Following a visit in which study eligibility was determined and informed consent forms were completed, MFP study staff instructed participants in how to complete a comprehensive food diary for the upcoming 4-day period. They were instructed to record food type, portion size, brand, and manner of food preparation for all foods and beverages consumed on a daily basis. To gather a relatively representative sample of food days while minimizing participant burden, the diary was completed on 4 consecutive days (ie, 2 weekdays and 2 weekend days), immediately prior to a second in-person visit. Subjects were instructed to carry a portable diary record during the day and to be sure to complete the full diary before retiring each night.

In order to insure compliance during the daily diary phase of the study, subjects were required to call the study office's answering machine each night before retiring, to verify that they had completed their diary for the day. Overall, compliance levels were extremely high, ie, approximately 80% when aggregated over all subjects and days. However, if a subject enrolled in the study's diary phase did not leave a nighttime verification message, project staff contacted the subject the next morning. The subject was instructed to complete the previous day's diary as soon as possible and was reminded to call the study office each evening. Through this procedure, none of the subject's diary data represented more than a 1-day retrospective report of data from the previous day.

At the second in-person appointment conducted on the day following the last diary day, study staff reviewed the diet diary with each participant, resolving any ambiguities or incomplete information.

Dietary Analysis. Data from reviewed and edited diet diaries were entered into The Food Processor (ESHA, version 7.0, Salem, Oregon), a nutritional analysis software package which derives nutrient information from over 1,200 scientific sources including the U.S. Department of Agriculture (USDA) data sets. While as many as 177 nutrients and nutritional factors are available from analysis, the focus here was on the following major nutrients: Total calories, protein, fat, total carbohydrates and dietary fiber, calcium, and iron.

Depressive Symptomatology. As a standard measure of psychological distress, the depression symptom scale from the Symptom Checklist-90 (SCL-90)[24] was utilized. For each of the 20 items on this self-report scale, the respondent was asked to indicate how much she was distressed by such symptoms as "crying easily," "blaming yourself

Table 1 Mean Nutrient Intakes for Women with MFP Compared with Northeast Region Women Aged 20 to 60 in CSFII

	Mean daily intake over 4 days, MFP women		Mean daily intake of Northeast region women age 20 to 60 CSFII		
Nutrient	n = 61	(SD)	n = 1,657	(SD)	**P* value
Calories	1619.34	495.84	1656.89	659.96	$P > .10$
Protein (grams)	65.01	20.43	65.30	29.04	$P > .10$
Total fat (grams)	58.22	27.53	60.30	34.02	$P > .10$
Total carbohydrates (grams)	209.33	62.94	212.70	89.93	$P > .10$
% Calories from protein	16.47	4.19	16.12	5.23	$P > .10$
% Calories from fat	31.54	8.07	31.70	9.85	$P > .10$
% Calories from carbohydrates	52.29	9.62	52.16	11.94	$P > .10$
Dietary fiber—total (grams)	12.68	5.64	13.53	7.65	$P > .10$
Calcium	639.00	291.82	664.91	389.37	$P > .10$
Iron	12.04	3.80	13.11	8.19	$P > .10$

**P* values represent results from ANCOVA (controlling for age, race, education).

for things," and "feelings of guilt." The 5 response categories ranged from "not at all" to "extremely." This self-report measure was completed during the second visit, referencing feelings during the prior 2-week period. In addition, a specific SCL-90 item assessing "poor appetite" was examined separately in analyses described below.

Pain. Pain severity during the 4 days corresponding to the diet diary were assessed through a separate, structured pain diary questionnaire. As part of the daily diary completed each evening, participants were asked to circle a number between 0 and 10 that corresponded to their average facial pain since they woke up that morning, where 0 = no pain and 10 = worst possible pain. The mean of the average pain scores across the 4 diary days was utilized in analyses below.

Self-Reported Food Consumption Difficulties. As part of the RDC[19] history questionnaire, respondents were asked whether their facial pain problem prevented or limited them in "chewing," "eating hard foods," or "eating soft foods." Responses were scored yes/no.

Data Analysis. All data were analyzed with SPSS (Version 9.0; SPSS Inc). When comparing MFP cases to the general population sample, independent sample *t* tests and analysis of covariance (ANCOVA), controlling for demographic differences between groups, were utilized. To test models of the relationship between dietary fiber and pain severity, depressive symptomatology and other factors, multiple linear regression analysis was utilized. A value of $P < .05$ was set for determining statistical significance, with values of $P < .10$ noted as nonsignificant trends.

Results

Self-reported difficulties with food consumption were examined first. Of the 61 participants with MFP, 88.5% (n = 54) indicated difficulty with chewing, 86.9% (n = 53) indicated difficulty in eating hard foods, and 24.6% (n = 15) indicated difficulty in eating soft foods.

Table 1 shows selected mean nutrient intakes over the 4 diet diary days for the 61 participating subjects with MFP. As a comparison point, Table 1 also displays reference values derived from the 1994–1996 CSFII. These reference values are weighted mean values for 1,657 women who, following selection procedures described above, represent general population demographic equivalents of the MFP patients. For none of the nutrient intakes examined were MFP cases significantly different from the CSFII sample (all $P > .10$). These conclusions were the same when conducting independent sample *t* tests or when conducting ANCOVA, controlling for sample differences in age ($t = 5.18$, $P < .001$) and nonsignificant differences in race and education.

Additional analyses were conducted, using data available only for the MFP sample, and focused on predictors of variability within the sample. A test of whether fiber intake or other nutrients differed among those who said they had difficulty eating either hard or soft foods was conducted. Testing for differences on each of the 10 nutritional factors (see Table 1 for listing), those who indicated that they had trouble eating hard foods did not differ significantly from those who did not indicate this difficulty on any nutrient. There was a nonsignificant trend ($P < .10$) for those reporting difficulty eating hard foods to consume a larger percentage of their calories from protein (mean = 16.82%, SD = 4.29) than those not reporting difficulty eating hard foods (mean = 14.19%, SD = 2.57).

Those who indicated that they had trouble eating soft foods (n = 15), when compared to those not reporting this difficulty (n = 46), showed a nonsignificant trend ($P < .10$) toward reduced intake of total calories (mean = 1441.76 kcal, SD = 359.50; versus mean = 1677.25 kcal, SD = 523.13), fat (mean = 51.68 gm, SD = 21.81; versus mean = 60.35 gm, SD = 29.05), and carbohydrates (mean = 187.19 gm, SD = 43.37; versus mean = 216.55 gm, SD = 66.93), as well as statistically significant reductions ($P < .05$) in iron (mean = 10.50 mg, SD = 2.99; versus mean = 12.55 mg, SD = 3.92) and calcium (mean = 533.28 mg, SD = 191.74; versus mean = 673.48 mg, SD = 311.71) intake.

Next, as a test of a pain adaptation model, an examination of whether dietary fiber intake was reduced as a function of facial pain severity occurred. A multiple linear regression model was developed in which total dietary fiber intake was predicted as a function of demographic controls (ie, age, years of education) and average pain severity. There was a significant negative relationship (b = -1.01, se = .38, $P < .01$) between pain severity and dietary fiber intake, so that higher pain levels were associated with reduced dietary fiber intake.

To test whether decreased dietary fiber intake that was associated with increased pain could have been a function of depressed mood among MFP patients, a multiple linear regression model was utilized in which total dietary fiber was predicted as a function of demographic controls (ie, age, years of education) and the score on the depression subscale of the SCL-90. First, a nonsignificant trend was found (b = -1.97, SE = 1.21, $P < .10$) for higher depression scores to be associated with decreased fiber intake. An examination occurred to determine whether "poor appetite" or overall caloric intake predicted dietary fiber intake, over and above the effect of demographic factors. While poor appetite was not significantly associated with dietary fiber intake (b = -0.41, SE = .68, $P > .10$), there was a trend for overall calories to be associated with dietary fiber intake (b = .03, SE = .00, $P < .10$).

To account for the possibility that decreased fiber intake associated with increased pain severity was a function of either depressive symptomatology or overall caloric reduction, pain severity and SCL-90 scores were simultaneously entered into a regression model predicting fiber intake. After accounting for demographic factors as well as mood and caloric intake, pain severity continues to bear an independent negative relationship (b = -0.88, SE = .39, $P < .05$) with dietary fiber intake.

To better interpret the finding that decreased dietary fiber is associated with increased pain, a comparison was made between the nutrient intake of MFP patients with pain severity at or above the median level of 4-day average pain (ie, 3.5 on a 10-point scale) to demographically equivalent women participating in the CSFII. As shown in Table 2, even those MFP patients with above-average pain did not significantly differ on most nutrient intake measures. The 1 exception was for dietary fiber intake. Those with more severe MFP pain consumed significantly less ($P < .01$) dietary fiber than their demographic counterparts in the general population.

Finally, to test the possibility that decreased fiber intake in those with severe pain was secondary to a clinician's recommendation to alter one's diet rather than patient-initiated change, a test was conducted to determine whether those who had previously received treatment for their MFP (n = 44) differed in dietary fiber intake from those who indicated that they had not previously received treatment for their MFP (n = 17). Independent sample *t* tests showed that dietary fiber intake for treatment recipients (mean = 12.40, SD = 4.16) did not differ significantly from dietary fiber intake for nontreatment recipients (mean = 13.42, SD = 8.48), ($t = 0.47$, $P > .10$).

Discussion

This study extends previous reports[3,4] suggesting that MFP patients alter their diet because they have difficulty chewing certain foods. Our data indicate that, when comparing the full sample of MFP patients to a demographically equivalent general population sample, there are no differences on major nutrient intake indicators. This suggests that the average MFP patient is unlikely to be different from other demographically similar women in dietary intake.

Table 2 Mean Nutrient Intakes for Women with MFP at or Above the Median Pain Level Compared with Northeast Region Women Aged 20 to 60 in CSFII

Nutrient	Mean daily intake over 4 days, MFP women with higher pain n = 32	(SD)	Mean daily intake of Northeast region region women age 20 to 60 CSFII n = 1,657	(SD)	*P value
Calories	1654.44	510.31	1656.89	659.96	$P > .10$
Protein (grams)	66.73	23.11	65.30	29.04	$P > .10$
Total fat (grams)	59.87	26.56	60.30	34.02	$P > .10$
Total carbohydrates (grams)	212.10	67.26	212.70	89.93	$P > .10$
% Calories from protein	16.39	4.29	16.12	5.23	$P > .10$
% Calories from fat	32.18	8.36	31.70	9.85	$P > .10$
% Calories from carbohydrates	51.50	9.74	52.16	11.94	$P > .10$
Dietary fiber—total (grams)	11.40	3.84	13.53	7.65	$P < .01$
Calcium (mg)	619.15	246.40	664.91	389.37	$P > .10$
Iron (mg)	12.03	3.62	13.11	8.19	$P > .10$

**P* values represent results from ANCOVA (controlling for age, race, education).

On the other hand, analyses conducted solely within the MFP sample suggest that more severe MFP pain is associated with an altered diet. While self-report of difficulty chewing hard foods does not correspond well with actual dietary intake, MFP patients who self-report difficulty chewing soft foods had reduced calcium and iron intake.

Since questions about prevention or limitation in eating hard or soft foods bore relatively poor correspondence to actual nutrient intake, it appears that the global food-related questions forming part of the RDC[19] history questionnaire are unlikely to be sufficiently sensitive or specific to identify the subgroup of MFP patients who are most likely to have some forms of altered nutrient intake due to masticatory muscle pain. Questions about "hard" or "soft" foods asked as part of the standard RDC assessment of functional problems does not specify foods or food groups. As such, identification of foods that are "hard" or "soft" is left up to the individual. Interpretation and identification of foods that are hard or soft is likely to be quite variable. Additionally, hard foods such as popcorn are not necessarily difficult to chew. Future studies incorporating diet-related questions regarding functional consequences of pain should identify specific foods as "hard" or "soft" in order to better understand functional alterations due to pain or perceived difficulty chewing.

Within the MFP sample, those with higher pain levels consume less dietary fiber. Reduced dietary fiber intake does not appear to be due to overall reduced caloric intake, depressive symptomatology, or decreased appetite. Nor does it appear that dietary fiber reduction is secondary to the common treatment recommendation[25] to alter one's diet, since those with and without previous treatment for MFP had similar fiber intake levels.

When contrasting the MFP patients with above-average pain to the general population sample of demographically equivalent women, a single difference in nutritional intake emerges. Women with more severe MFP pain have lower dietary fiber intake than their demographic counterparts in the general population.

Taken in concert, these data confirm that individuals with greater intensity of MFP alter their diet in ways designed to decrease their masticatory activity. This dietary alteration is implemented to avoid experiencing more facial pain.

Is this decrease in dietary fiber of sufficient magnitude to raise a concern about nutritional deficiency or increased health risk among those with severe MFP? Total dietary fiber was not lower in the full MFP sample compared to a general population sample, but the intake of 11.4 grams in the high-pain MFP sample was significantly lower than the intake of 13.6 in the general population sample. In any case, both the full MFP and general population sample consumed much less dietary fiber than standard nutritional guideline recommendations[26] of 25 to 35 grams per day. Health risks associated with lowered dietary fiber intake include constipation, diverticular disease, and heart disease. Diets rich in dietary fiber with fruits and vegetables are associated with a reduced risk of heart disease, hypertension, and stroke.[27,28]

The low dietary fiber intake pattern observed in this cohort may have long-term consequences for other health problems in those with MFP. A special concern for MFP patients may be the relationship between irritable bowel syndrome and low dietary fiber intake.[29,30] MFP patients have elevated rates of irritable bowel syndrome, ie, 64% in 1 study[31] and 46% in another,[32] rates that far exceed general population estimates.[33,34] Dietary fiber is part of a comprehensive treatment regime[30] for constipation-predominant irritable bowel syndrome. The failure of the typical MFP patient—and especially the MFP patient with more severe pain—to consume sufficient fiber may lead to exacerbation of bowel distress.

There are several limitations to this study. First, we may have underestimated the impact of MFP on dietary alteration by focusing on macronutrients, especially dietary fiber, rather than food texture, consistency, or chewiness. Ideally, we would have liked to analyze diet not just by nutritional properties but by studying food groups and specific foods omitted/emphasized in the diet, as well as food textures, as the latter is most likely to be linked with masticatory muscle activity required for consumption. Although dietary fiber is likely to be the nutritional component that bears the closest relationship to food texture or chewiness, it is undoubtedly a poor proxy. Studies of individual food textural properties have appeared,[35] but a comprehensive inventory of food properties that would permit an analysis focused on food texture is not currently available.

Other factors may have attenuated differences between the MFP and general population sample. First, the 2-day dietary assessment period of the CSFII and the 4-day period used by MFP subjects may have been insufficient to reflect day to day variability in food intake. This may have introduced random error which, in turn, reduced statistical power.[36] In addition, for other study purposes, the MFP sample excluded women who met diagnostic criteria but who had a poor dentition (ie, less than 6 maxillary and 6 mandibular posterior natural teeth that occluded) or removable partial dentures. Individuals with impaired dentition were undoubtedly present in the general population sample. Such problems may have led to self-imposed dietary restrictions[37–41] in the general population sample. The MFP sample, comprised of individuals with above-average remaining teeth, were less likely to have restricted their diet due to dental problems. Thus, because of different exclusion criteria for the MFP and general population samples and because of reduced statistical power related to the brevity of the diet assessment periods in both samples, we may have failed to detect some differences between groups in nutrient intake.

Although the CSFII provided a useful contrast group in which to interpret nutrients derived from MFP subjects' daily diaries, there are inherent limitations to such a comparison. This study used daily diet diaries to derive nutritional data; the CSFII relied on 2 days of 24-hour diet recall. Ideally, observation, weighing, and recording actual intake is the only way to truly determine food intake, but it is intrusive and impractical. All other methods are likely to contain error,[36] although there is some evidence that food diaries more closely correspond to intake from direct observation.[42] Another difference between the 2 data sets is the time period during which data were collected. The most recently available CSFII data set represents reports of participants collected between 1994 and 1996, whereas the data from the MFP subjects were collected between 1997 and 1999. To the extent that there are changes in dietary fashions within populations over time,[43] we may have underestimated the magnitude in differences in fiber intake (and other nutrients) between women with MFP versus those in the general population.

An additional difference between the 2 data sets is that the MFP subjects' daily diaries were collected on 2 weekends and 2 weekdays. For CSFII participants, the 2 dietary recall days could have been weekends, weekdays, or a combination of the 2 periods. Although the limited research comparing adult food intake on weekends versus weekdays suggests that differences are slight,[44] we checked to insure that this difference in procedures between the samples did not account for any differences found. In analyses not detailed above, we first identified 418 women from the larger sample of 1,657 community women who had completed their dietary assessments on 1 weekend day and 1 weekday so that, like the MFP subjects, their intake data was based on similar proportions of weekday and weekend consumption. We found that the mean intake of fiber for this smaller community sample was virtually identical to that of the

Table 3 "Non-hard" Food Sources of Dietary Fiber

Food group	Sample foods
Whole grains, breads, cereals	Fresh oatmeal Bran cereals with milk Wheatena Popcorn
Vegetables	Steamed and chopped: Broccoli, carrots, cabbage Chopped raw tomatoes, celery Cooked: Peas, corn
Fruits	Strawberries, raspberries, blueberries, mango Cooked: Prunes, figs
Protein	Legumes: Split peas, lentils, beans (kidney, black, cannelloni, pink, etc.)

larger community sample (ie, 13.59 grams versus 13.53 grams) and, when conducting all relevant analyses using this smaller community sample, all findings remained consistent. Thus, differences in fiber intake between women with severe MFP and women in the community have not been confounded by differences in period of the week in which intake data were collected.

Low dietary fiber is associated with chronic constipation.[26] Constipation is also a side effect of several drugs widely used in the treatment of myofascial pain such as tricyclic antidepressants[45] and opioids.[46] Since these drugs are more likely to be prescribed in the case of more severe MFP pain, those with severe MFP who restrict their dietary fiber intake may have multiple risk factors for constipation. Furthermore, patients may be reluctant to discuss this important problem with their treating dentist. It may serve the patient best if the clinician inquires about bowel function and alterations in dietary intake patterns and makes appropriate suggestions or referrals.

Given that our data support the concept that consumption of high fiber foods is more difficult for those with severe myofascial face pain, clinical recommendations need to consider dietary sources of fiber that require less masticatory activity for consumption. Table 3 lists food rich in dietary fiber that do not require excessive chewing action. Individuals should be encouraged to read labels for "soft" breads and grain products rich in fiber (ie, at least 3 to 4 grams per serving), to incorporate legumes and beans into the diet more often, and to choose fiber-rich fruits and vegetables that can be cooked, sliced, and/or chopped to facilitate eating and to reduce any potential for discomfort. Individuals who continue to have difficulty eating should be referred to a registered dietician for medical nutrition therapy.

In summary, these data confirm that a subset of MFP patients alter their food intake pattern as part of overall pain adaptation. They document an impact of MFP on quality of life that has received limited attention. Clinical recommendations to MFP patients who have altered their food intake pattern should include suggestions about easily chewed sources of dietary fiber.

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