

Care Seeking for Orofacial Pain

Annemiek Rollman, PT

PhD Student
Department of Oral Kinesiology
Academic Centre for Dentistry
Amsterdam (ACTA)
Research Institute MOVE
University of Amsterdam and
VU University Amsterdam
Amsterdam, The Netherlands

Corine M. Visscher, PT, PhD

Associate Professor
Department of Oral Kinesiology
Academic Centre for Dentistry
Amsterdam (ACTA)
Research Institute MOVE
University of Amsterdam and
VU University Amsterdam
Amsterdam, The Netherlands

Ronald C. Gorter, PhD

Psychologist,
Department of Social Dentistry &
Behavioural Sciences
Academic Centre for Dentistry
Amsterdam (ACTA)
University of Amsterdam and
VU University Amsterdam
Amsterdam, The Netherlands

Machiel Naeije, PhD

Professor and Chair
Department of Oral Kinesiology
Academic Centre for Dentistry
Amsterdam (ACTA)
Research Institute MOVE
University of Amsterdam and
VU University Amsterdam
Amsterdam, The Netherlands

Correspondence to:

Dr Corine Visscher
Department of Oral Kinesiology
Academic Centre for Dentistry
Amsterdam (ACTA)
Gustav Mahlerlaan 3004
1081 LA Amsterdam
The Netherlands
Email: c.visscher@acta.nl

***Aims:** To determine the contribution of a wide range of factors to care-seeking behavior in orofacial pain patients, expressed as (A) decision to seek care and (B) number of health care practitioners visited. **Methods:** Subjects with orofacial pain complaints were recruited in seven TMD clinics and from a nonclinical population sample. They received a questionnaire including a wide range of possible predictors. To study which predictive variables were associated with the decision to seek care and with the number of health care practitioners visited, multiple regression models were built. **Results:** Two hundred three persons with orofacial pain participated in the study. Of these participants, 169 (140 females) had visited at least one health care practitioner (care seekers), while the other 34 persons (25 females) did not (non-care seekers). The decision to seek care was not only associated with the pain intensity ($P < .05$), but, in women, also with fear of jaw movements ($P < .01$): Women with more fear of jaw movements were more likely to seek care. Pain intensity and disability were not associated with the number of health care practitioners visited. Instead, the main predictors were catastrophizing ($P = .004$) and the use of painkillers ($P = .008$). **Conclusions:** Pain intensity and fear of jaw movements play an important role in the decision to seek care for orofacial pain. The continuous search for help is associated with catastrophizing and the use of painkillers.*

J OROFAC PAIN 2012;26:206–214

Key words: care seeking, health care utilization, orofacial pain, predictors

Orofacial pain is a common pain condition associated with the hard and soft tissues of the face and mouth. Its prevalence in the general population is approximately 13% (range, 1% to 48%).¹ Chronic orofacial pain is most commonly associated with temporomandibular disorders (TMD) but may also arise from other sources, such as dental origins or trigeminal neuralgia.² It shares features with other chronic pain conditions, including modest associations between symptom severity and physical findings, greater prevalence among women, and significant psychological distress.²

It is estimated that only half of the people with orofacial pain seek treatment for their complaints. Information regarding the motivation to seek care for orofacial pain could help to improve health care, by focusing more on patients' needs. However, most studies that compare care seekers and non-care seekers have focused on other pain conditions, such as low back pain. A recent review showed that higher disability levels and being female play a role in care-seeking for low back pain.³ However, the impact of low back pain on someone's daily life may be different from that of orofacial

pain, and therefore other determinants may play a role in the decision to seek care for orofacial pain complaints. At present, only a few papers^{4,5} have studied what motivates people to seek care for orofacial pain.

Apart from the decision whether or not to visit a health care practitioner, care-seeking patterns of patients who utilize health care differ a great deal: Some patients only visit one health care practitioner, while others continue to search for help and visit multiple providers. In a study that included patients with various chronic pain conditions (ie, back pain, headache, or TMD pain), it was found that patients with frequent health care use had more severe pain and more psychological distress than pain patients with less frequent use of care.⁶ In the same study, however, patients who frequently used care for conditions caused by serious pathology (eg, cancer) versus patients who frequently used care for benign conditions (eg, aspecific low back pain) were not markedly different on measures of pain severity, worry about pain, or somatization. This illustrates the complexity of care-seeking behavior, and calls for increased attention to the patients' motivation to attend a health care provider. Improved insight in the patient's perspective regarding their use of health care may provide important information to enhance current treatment strategies, especially for those patients who are at risk to develop chronic pain complaints.

The objective of this study was to determine the contribution of a wide range of factors (eg, physical symptoms, psychological factors, and socioeconomic aspects) to care-seeking behavior in orofacial pain patients, expressed as (*A*) decision to seek care, and (*B*) number of health care practitioners visited.

Materials and Methods

In this study, data of care seekers as well as non-care seekers were collected. Therefore, subjects were recruited among patients who visited one of seven participating centers for temporomandibular disorders within The Netherlands (Amsterdam [two centers], Alkmaar, Arnhem, Breda, Den Haag, Zwolle) (care seekers), and among a nonclinical population sample (care seekers and non-care seekers). The medical ethical committee of the VU University of Amsterdam approved the study (file number 2004/166).

The subjects from the TMD clinics were recruited between December 2007 and January 2009. In that period, information letters were sent to each consecutive patient who called in for a TMD referral at one of the TMD clinics. They were invited to re-

turn a short form to the principal investigator (PI: AR). This form consisted of an informed consent and of some questions regarding the inclusion and exclusion criteria. Those subjects who fulfilled the selection criteria and who had indicated they were willing to participate in the study then received the survey questionnaire and were asked to return these documents to the principal investigator (AR).

The subjects from the nonclinical population sample were recruited in the summer of 2008 at public places in and around the city centers where the TMD clinics were located. Three trained interviewers randomly interviewed passersby about the presence of orofacial pain. Persons who reported orofacial pain within the last month were invited to participate in the study. When they were interested, they were asked to complete the informed consent, the form with the selection criteria, and the survey questionnaire at home, and to return these documents to the principal investigator (AR).

When participants did not return the documents within 3 weeks, a reminder was given by mail or phone (depending on which contact data were available). If necessary, a second reminder was given after 6 weeks.

Study Design and Study Population

The inclusion criteria for the study population were:

- Self-report of orofacial pain within the last month (verified by a positive answer on the following question: "Did you have pain in your face in the past month?")
- At least 18 years of age
- Good understanding of the Dutch language

To exclude as much as possible dental pain and rare causes of orofacial pain (eg, neuralgias), the following exclusion criteria were adopted:

- Report of localized dental pain
- Burning sensation of the tongue or mouth
- Shooting pain provoked by touch (eg, by washing or shaving)
- Diagnosis of a systemic disease (eg, rheumatoid arthritis) or of cancer in the head or neck region

Predictors (Independent Variables)

The survey questionnaire consisted of a wide variety of items possibly associated with care-seeking behavior. Where available, these so-called "predictors" were measured with validated and reproducible

methods. To ascertain its user-friendliness, the survey questionnaire was evaluated in five orofacial pain patients prior to the study. Consequently, the factor income level (socioeconomic domain) was deleted because patients found it offensive. The final survey questionnaire took about 25 minutes to complete; it consisted of the following variables:

Demographics. Age (in years) and sex were noted.

Pain Duration. The duration of pain was classified as: 0 to 3 months; 3 to 6 months, 6 to 12 months, 1 to 3 years, 3 to 10 years, or > 10 years.

Pain Intensity. The so-called “characteristic pain intensity” (CPI) was measured according to the Research Diagnostic Criteria for TMD (RDC/TMD).⁷ For the CPI, the 0 to 10 ratings of the questions regarding “current pain,” “worst pain in the past 6 months,” and “average pain in the past 6 months,” are averaged and multiplied by 10 (range: 0 to 100; higher scores denote more pain).

Pain-Related Disability. The degree of disability due to the orofacial pain was rated with the “disability score” (DS).⁷ For the DS, 0 to 10 ratings of interferences with “daily activities,” “social activities,” and “work/housework in the past 6 months” are averaged and multiplied by 10 (range: 0 to 100; higher scores denote more disability).

Hindrance on Function. The Patient-Specific Approach (PSA) was used to report the most important activity that was difficult to perform because of their orofacial pain. The amount of hindrance experienced when performing this activity is measured on a 100-mm visual analog scale (VAS), range: 0 to 100; higher scores denote more hindrance on function).⁸

Widespread Pain. Pain sites outside the orofacial region experienced in the past 6 months were marked on the body drawing of the McGill Pain Questionnaire.⁹ The number of painful body sites was counted according to the method proposed by Lobbezoo et al¹⁰; it included neck, shoulders, arms, chest, abdomen, back, and legs (range: 0 to 7; higher scores denote more widespread pain).

Use of Painkillers. The current use of any painkillers for orofacial pain was noted (yes/no).

Fear of Jaw Movements. The extent of agreement with the proposition “I’m afraid that I might injure myself if I move my jaw” was rated on a 4-point Likert scale, ranging from “strongly disagree” (1) to “strongly agree” (4). This item was derived from the Tampa Scale for Kinesiophobia for TMD¹¹ (range: 1 to 4; higher scores denote more fear of jaw movements).

Coping Strategies. The Pain Coping and Cognition List (PCCL) was used to measure attributions, expectancies, and cognitive coping strategies related to pain.¹² It consists of 42 items that are rated

on a 6-point Likert scale ranging from “totally disagree” (1) to “totally agree” (6) and results in a score on 4 scales: catastrophizing (range: 1 to 6; higher scores denote more negative thoughts about the catastrophic consequences of pain), pain coping (range: 1 to 6; higher scores denote the use of more strategies to cope with pain, such as diverting attention or ignoring pain), internal pain control (range: 1 to 6; higher scores denote more positive expectancies about personal control over pain), and external pain control (range: 1 to 6; higher scores denote more positive expectancies about control over pain by medical specialists, influential others, or supernatural influences).

Psychological Distress. Depression and somatization were measured by the Symptom Check List 90 (SCL-90).¹³ In this questionnaire, depression represents symptoms of low mood and aversion to activity (range: 16 to 76; higher scores denote more depression within the last month). The somatization scale assesses bodily symptoms, such as faintness and stomach upset, associated with a general feeling of physical complaints (range: 12 to 60; higher scores denote more somatization within the last month).

Dental Anxiety. The Dental Anxiety Scale (DAS), a 4-item questionnaire scored on a 5-point Likert scale, was used to measure fear of a visit to the dentist and unwarranted anxiety over dental procedures (range: 4 to 20; higher scores denote more anxiousness).^{14,15}

Satisfaction with Pain-Related Social Support. Satisfaction with social support in relation to pain was scored with the Social Support and Pain Questionnaire (SPQ). The SPQ consists of six items on perceived satisfaction with the following social support themes: perceived support, advice, social companionship, affective support, reassurance, and practical support. Each item is scored on a 5-point Likert scale ranging from very “dissatisfied” (0) to “very satisfied” (4) (range: 0 to 24; higher scores denote more satisfaction with pain-related social support).¹⁶

Ethnic Background. Ethnic background was established following the method of Statistics Netherlands (CBS), an organization that collects and publishes Dutch population data for research purposes and policymaking. According to this method, ethnic background is determined by the country of birth of the individual and by that of his or her parents, leading to the following classification: Native Dutch (ND), Non-Native Western (NNW), and Non-Native Non-Western (NNNW).¹⁷

Level of Education. The level of education was categorized in the following four groups: no education, low (primary school), middle (junior vocational

education/secondary vocational education), and high (vocational colleges/university).¹⁸

Employment. Current employment was noted (yes/no).

Household Situation. Living alone or not was noted (yes/ no).

Outcome Measures (Dependent Variables)

Decision to seek care (A). The participants were classified as “non-care seekers” or “care seekers.” They were considered to be “non-care seekers” (coded as 0) when they had never sought care for their orofacial pain complaints. When a participant had visited at least one health care practitioner for orofacial pain, that participant was considered a “care seeker” (coded as 1).

Number of health care practitioners visited (B). The number of health care practitioners visited was the total number of health care practitioners the participant visited for the orofacial pain complaint.

Data Analyses

T tests and χ^2 tests were used to determine whether differences in age, sex, and place of recruitment were present between those subjects who returned the survey questionnaire and those subjects who did not.

To study which predictive variables were associated with care seeking, both for (A) decision to seek care and (B) number of health care practitioners visited, a multiple regression model was built (for decision to seek care, logistic regression was used; for number of health care practitioners visited, linear regression was used). First, single regression analyses were performed to determine the association between the various predictors and the respective outcome measure. Since a strong correlation between pain duration and number of health care practitioners visited is anticipated (circular argument), the associations between predictors and number of health care practitioners were corrected for pain duration in the final model. Predictors that showed at least a moderate association with the outcome measure (ie, *P* value $\leq .10$) were entered in the multiple regression analysis. Then, the variable with the weakest association with care seeking was removed from the multiple regression model. This was repeated in a backward stepwise manner until all variables that were retained in the model showed a *P* value $\leq .05$. Finally, interactions between these predictive variables and age, sex, data-collection method (nonclinical versus TMD clinics), and city of recruitment were checked. In case of a significant interaction effect, stratified regression models are

presented. The explained variance of the multiple regression models is expressed by Nagelkerke’s R^2 .

For the final multiple regression model, the assumptions for linearity (linear relation of residuals, independent observations, normal distribution of residuals, and equal standard deviations of residuals) were checked. This was done by inspection of the “normal P-P plot of regression standardized residual” (normal distribution of residuals), and of the “scatterplot of the standardized residuals and the standardized predicted values” (linear relation of residuals and equal standard deviations of residuals). Since for all variables only one observation per individual was collected, the assumption of independent observations was already met.

The Hosmer and Lemeshow test was calculated as a measure of goodness of fit of the logistic regression analysis (a nonsignificant test outcome indicates a good fit).¹⁹ SPSS Statistics version 17.0 was used to analyze the data.

Results

Figure 1 shows a flowchart of the data collection for the survey questionnaires. Fifty-nine percent of the subjects who were recruited at one of the TMD clinics and who had received the survey questionnaire returned the questionnaire (129 out of 220); in the group that was recruited from the nonclinical population this percentage was 70% (112 out of 160). Persons who did not respond did not differ from the responders with respect to age ($t = 1.892$; $P = .817$), sex ($\chi^2 = 0.002$; $P = .961$), and city of recruitment ($\chi^2 = 0.358$; $P = .551$).

In total, 203 persons with orofacial pain were included in the study. Their mean age was 40 years (SD: 16 years) and 83% were female. Most participants were recruited in Amsterdam (60%), followed by The Hague (12%), Alkmaar (8%), Arnhem (8%), Zwolle (8%), and Breda (5%). From the 74 subjects recruited from the nonclinical population who fulfilled the inclusion and exclusion criteria, 40 reported to have visited at least one practitioner for their orofacial pain complaints. Most of them had visited primary care practitioners (physical therapist, dentist, or home physician), and some had seen a medical specialist (8%) or an alternative medicine practitioner (8%). No differences in age and sex were found between the two groups of care seekers (age: $t = -0.360$, $P = .719$; sex: $\chi^2 = 0.025$, $P = .874$) and they were subsequently analyzed as care seekers.

In total, 169 participants had visited at least one health care practitioner for their orofacial pain

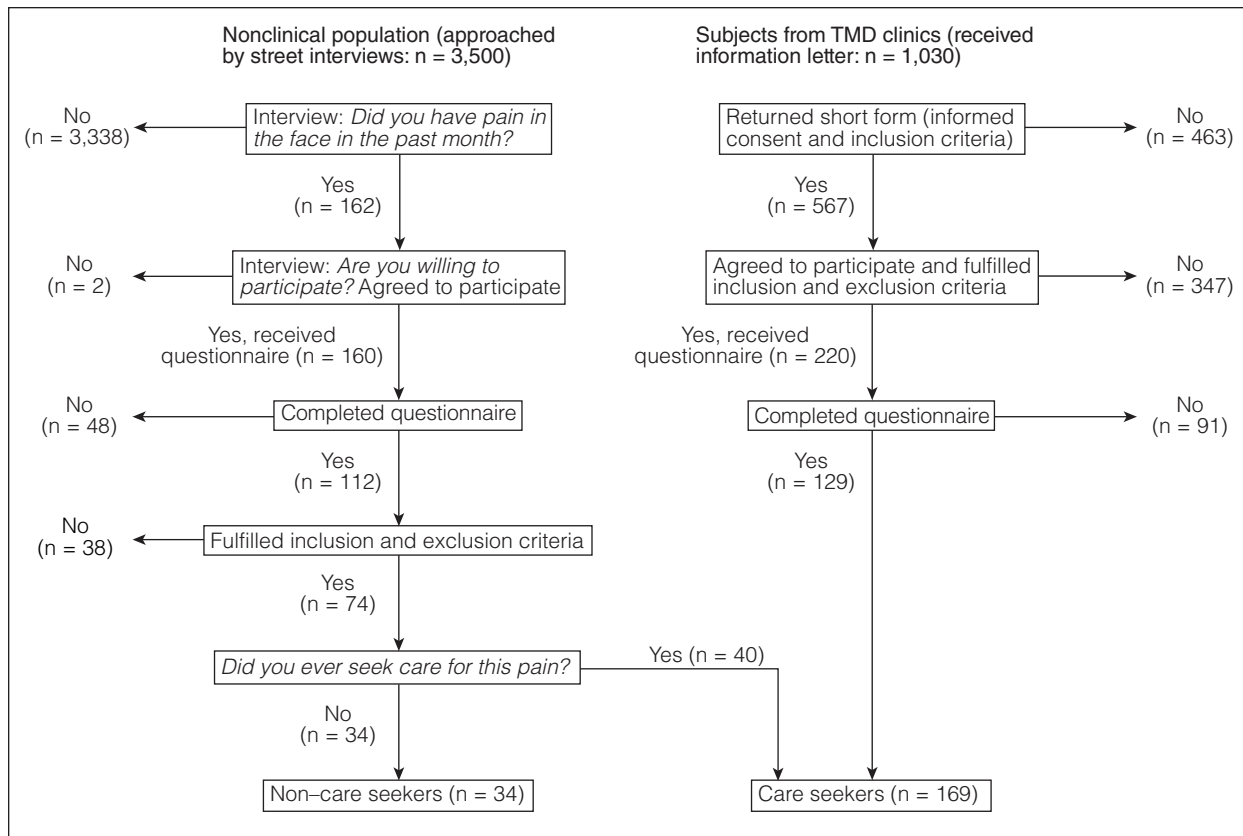


Fig 1 Flowchart of the data collection of non-care seekers and care seekers.

complaints (care seekers), while 34 persons did report orofacial pain but had never visited a health care practitioner for their complaints (non-care seekers). In Table 1 the descriptives of the predictors are presented for both the non-care seekers and care seekers.

Decision to Seek Care

In Table 2, the predictive variables that showed at least a moderate association ($P < .10$) with the decision to seek care are presented. From these variables, pain intensity and fear of jaw movements were retained in the multiple regression model (not shown). Since, in this multiple regression model, an interaction effect between sex and fear of jaw movements was found ($P = .04$), the analysis was subsequently stratified for sex. For women, both predictors were retained in the final multiple logistic regression model, while for men no association with fear of jaw movements could be found ($P = .65$) (Table 2).

Number of Health Care Practitioners Visited

In the subsample of participants who did seek care ($n = 169$), the number of health care practitioners

visited ranged from one to six (Fig 2). Most participants visited a dentist, physical therapist, or home physician; some visited a neurologist, oral surgeon, or acupuncturist. The predictive variables that were at least moderately associated with the number of health care practitioners visited are presented in Table 3. Catastrophizing and the use of painkillers were retained in the multiple linear regression analysis (corrected for pain duration), and no interaction effects were found (Table 3). All the assumptions for linearity of the multiple regression model were met.

Discussion

In this study, two aspects of care-seeking behavior for orofacial pain were investigated: factors that are related to the decision to seek care and factors that are related to the number of health care practitioners visited. Different factors play a role in these two aspects of care-seeking behavior. The decision to seek care was associated with the intensity of the orofacial pain and with fear of jaw movements, while the number of health care practitioners visited was associated with the coping strategy of catastrophizing and with the use of painkillers.

Table 1 Descriptives of the Predictive Variables (n = 203)

Predictive variable	Non-care seekers (n = 34)	Care seekers (n = 169)
Age (y)	37.7 (17.3)	42.1 (14.4)
Sex		
Female	74%	82%
Pain duration		
0-3 months	15%	10%
≥ 3 < 6 months	15%	14%
≥ 6 months < 1 year	13%	14%
≥ 1 year < 3 years	22%	23%
≥ 3 years < 10 years	13%	18%
≥ 10 years	22%	21%
Pain intensity (0–100)	33.4 (18.7)	52.2 (18.4)
Pain-relevant disability (0–100)	8.4 (16.8)	25.5 (26.0)
Hindrance on function (0–100)	25.3 (25.1)	40.0 (27.6)
Widespread pain (0–7)	2.3 (2.0)	2.9 (2.2)
Use of painkillers		
Yes	13%	48%
Fear of jaw movements (1–4)	1.4 (0.9)	1.9 (1.0)
Catastrophizing (1–6)	1.8 (0.7)	2.0 (0.8)
Pain coping (1–6)	2.9 (1.0)	3.1 (1.0)
Internal pain control (1–6)	3.6 (1.0)	3.3 (1.0)
External pain control (1–6)	2.2 (0.9)	2.5 (0.9)
Depression (16–76)	24.3 (7.2)	24.4 (9.4)
Somatic complaints (12–60)	19.0 (5.0)	20.7 (7.1)
Dental Anxiety Scale (1–4)	2.0 (0.7)	2.1 (0.9)
Social support (0–24)	15.2 (3.6)	14.2 (5.3)
Ethnic background		
ND	84%	87%
NNW	16%	8%
NNNW	0%	5%
Level of education		
No	6%	2%
Low	0%	2%
Middle	48%	53%
High	46%	43%
Employment		
Yes	71%	73%
Household situation		
Living alone	32%	23%

Continuous variables are presented as mean values (\pm SD); categorical variables are presented as percentages.

The challenge for studies assessing the decision to seek care is to find a control sample of persons who did not seek care for their pain. Obviously, these persons are not registered, and therefore in this study non-care seekers were recruited at public places by means of a short interview of random passersby. This

method was chosen because a face-to-face approach usually results in a higher response rate than mail or telephone surveys.²⁰ This was also illustrated by the higher response rate in the nonclinical population (70%) as compared to the TMD-clinic sample (almost 60%). These numbers are comparable

Table 2 Predictive Variables for the Decision to Seek Care (ie, Non-Care Seekers vs Care Seekers) in the Logistic Regression Analyses (n = 203)

	Single regression			Multiple regression					
	P	OR	95% CI	Males			Females		
				P	OR	95% CI	P	OR	95% CI
Pain intensity (0–100)	<.001	1.06	1.03–1.08	.011	1.07	1.02–1.13	.002	1.05	1.02–1.13
Fear of jaw movements (1–4)	.013	1.89	1.15–3.12	NS	NS		.004	3.20	0.28–2.00
Use of painkillers (no/yes)	.001	6.52	2.19–19.40						
Hindrance on function (0–100)	.010	1.02	1.01–1.03						
Pain-relevant disability (0–100)	.002	1.04	1.02–1.07						
Female	.090	2.13	0.89–5.10						

The explained variance (R^2) of the final multiple regression model was 0.31 for men and 0.33 for women. Hosmer and Lemeshow test: $P = 0.839$ for women and $P = .402$ for men. OR = odds ratio; 95% CI = 95% confidence interval; NS = not significant.

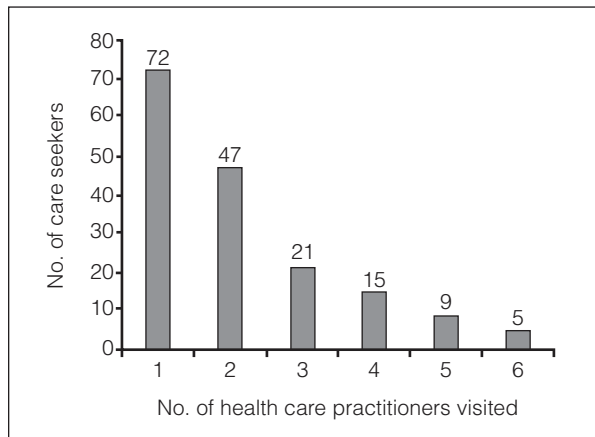


Fig 2 Number of health care practitioners visited by the 169 care seekers.

Table 3 Predictive Variables for the Number of Care Practitioners Visited (n = 169)

Predictive variables	Single regression				Multiple regression			
	B	95% CI	β	P	B	95% CI	β	P
Use of painkillers (no/yes)	0.769	0.372–1.175	0.282	< .001	0.559	0.147–0.970	0.202	.008
Catastrophizing (1–6)	0.478	0.227–0.747	0.282	< .001	0.384	0.127–0.970	0.223	.004
Pain duration	0.194	0.068–0.319	0.229	.003	0.204	0.080–0.329	0.236	.001
Pain-relevant disability (0–100)	0.018	0.011–0.026	0.351	< .001				
Pain intensity (0–100)	0.020	0.009–0.031	0.269	< .001				
Somatic complaints (12–60)	0.044	0.017–0.071	0.244	.001				
Hindrance on function (0–100)	0.011	0.003–0.019	0.226	.005				
External pain control (1–6)	0.225	–0.013–0.464	0.146	.064				
Widespread pain (0–7)	0.090	–0.015–0.195	0.131	.093				

The single and the multiple linear regression model explains factors related to the number of health care practitioners visited (multiple regression model $R^2 = 0.18$). Associations are expressed in regression coefficients (B), 95% CI, and standardized regression coefficients (β).

to those found in similar study designs.^{5,21} In the recruitment at public places, people with orofacial pain who had sought care also were found (n = 40). They were added to the group of care seekers that was recruited in the TMD clinics. The regression analysis showed that the method of recruitment (public places or TMD clinics) did not interact with

the other predictors in the models. To build a multiple regression model for the decision to seek care with up to three predictors,¹⁹ the present authors aimed (and succeeded) to recruit at least 30 non-care seekers. The low prevalence of orofacial pain (approximately 5%), in combination with the observation that about half of them did not seek care,

accounts for the high number of passersby who had to be approached. Although the observed prevalence of orofacial pain is quite lower than that found in a recent general population study (26%),⁵ it is within the range of earlier findings (1% to 48%).¹ Also, the percentage of persons who did not seek care for these complaints is comparable to that reported by Macfarlane et al (46%).²² The majority of care seekers (129) were recruited in TMD clinics, while the other 40 were recruited in public places. Because of the exclusion criteria employed to exclude dental pain as well as rare causes of orofacial pain in both groups, the authors believe it is likely that most of these 169 participants were suffering from temporomandibular pain.

Since two of the participating TMD clinics were located in Amsterdam, most participants of the study were from the Amsterdam region. However, since none of the predictive factors showed an interaction effect with the city of recruitment, the results of the multiple regression analyses can probably be generalized over the various regions in the study.

Decision to Seek Care

This study confirmed earlier findings⁵ that the decision to seek care for orofacial pain is associated with its pain intensity and is the first to show that, in women, the decision to seek care is also related with the scores on fear of jaw movements. The apparently low value of the OR for pain intensity (1.05 for women and 1.07 for men) is related to its measurement unit (millimeters). For each increase of 1 mm on the VAS, a female subject is 1.05 times more likely to seek care. Recalculating the OR for a scale in centimeters would lead to an apparently stronger value of 1.63 for women and 1.97 for men (but with the same statistical significance).

The OR of 3.20 for fear of jaw movements indicates that women with high scores (score = 4) show odds for seeking help that are 33 times higher than in women with low scores on fear of jaw movements (score = 1). Further study should elaborate whether the absence of this association in men is due to the low number of male non-care seekers in the present study, or whether it represents a true sex difference in care-seeking behavior. Because the majority of the patients who seek care for orofacial pain are female, the role of fear of jaw movements in the decision to seek help may open new perspectives for improving patient care.

So far, the role of fear of movement in care-seeking behavior has not been investigated in other musculoskeletal pain disorders, such as low back pain. Future studies should elaborate whether it plays a role in

care-seeking behavior in these disorders as well. In patients with low back pain, it was shown that disability levels were most strongly associated with care-seeking behavior,³ and this is in contrast to the present findings. In addition, when fear of jaw movements was excluded from the multiple regression model in the present study (data not shown), it was the intensity of pain that showed an association with care-seeking behavior and not the level of disability. Given that different factors are associated with care-seeking behavior in patients with low back pain and in patients with temporomandibular-like pain indicates that the impact a musculoskeletal disorder has on a patient depends on which musculoskeletal system is affected.

Number of Health Care Practitioners Visited

Predictors indicative of the severity of the orofacial pain complaint, such as pain intensity, disability, and hindrance, were not independently related to the care-seeking behavior of the patients, as expressed in the number of health care practitioners visited. Also, external pain control (ie, positive expectancies about control over pain by medical specialists or influential others) was not retained in the multiple regression model. This is surprising and raises the question why patients are willing to visit many health care practitioners when they show no positive expectancy of the practitioner's ability to treat their pain. Maybe they have gradually lost this expectancy after having received a number of unsuccessful treatments. Instead, "having catastrophizing thoughts" and "use of painkillers" showed an independent association with the "shopping" behavior of the patients. The finding on catastrophizing is in line with a suggestion by Turner et al.²³

It is interesting to note that two closely related factors, ie, fear of movement and catastrophizing, play a role in the multiple regression models for the decision to seek care and the number of health care practitioners visited. Both factors also play a key role in the fear avoidance.²⁴ In this model, a vicious circle of pain, catastrophizing thoughts, fear of movement and disability, all as a reaction to a painful injury, is thought to lead to the development of chronic pain complaints. These results subscribe to the relevance of an early recognition of patients' catastrophizing thoughts and fear of movement in the prevention of chronic orofacial pain.

A strong feature of this study is the wide range of predictors that were included in the survey questionnaire. Interestingly, many of the predictors thought to be relevant for care-seeking behavior³ showed no association with either the decision to seek care or the number of health care practitioners visited. For

example, no association was found with ethnicity, level of education, social support, or household situation. Perhaps with a larger sample size, some of the predictors could still reach the level of significance (eg, pain-related disability). Therefore, these results are considered exploratory, and they need to be further evaluated in future studies.

In addition, the regression models only explained a small part of the care-seeking behavior (see Table 2 and 3), indicating that other factors, not yet thought of, play an important role as well. Qualitative study designs, such as those based on structured patient interviews,²⁵ may be able to reveal these factors, important in care-seeking behavior.

Conclusions

This study has shown that pain intensity and fear of jaw movements play an important role in the decision to seek care for orofacial pain complaints. The continuous search for help is associated with catastrophizing thoughts and the use of pain medication.

Acknowledgments

The authors thank all colleagues at the Department of Oral Kinesiology who facilitated this study, with special appreciation to Carlijn van der Lugt and Stanimira Kalaykova for their help with the interviews of passersby. They also thank the collaborating TMD clinics for their help in the recruitment of orofacial pain patients: Amphia Ziekenhuis Breda, Haga Ziekenhuis Den Haag, Isala Klinieken Zwolle, Medisch Centrum Alkmaar, Stichting Bijzondere Tandheelkunde Amsterdam, and Ziekenhuis Rijnstate Arnhem. Especially, the authors would also like to thank the participants for their participation in the research. This study was supported by the Institute for Dental Sciences in the Netherlands (IOT).

References

- Macfarlane TV, Glenny AM, Worthington HV. Systematic review of population-based epidemiological studies of orofacial pain. *J Dent* 2001;29:451–467.
- Fillingim RB, Wallace MR, Herbstman DM, Ribeiro-Dasilva M, Staud R. Genetic contributions to pain: A review of findings in humans. *Oral Dis* 2008;14:673–682.
- Ferreira M, Machado G, Latimer J, Maher C. Factors defining care-seeking in low back pain—A meta-analysis of population based surveys. *Eur J Pain* 2010;14:e1–7.
- Locker D. The symptom iceberg in dentistry. Treatment-seeking in relation to oral and facial pain. *J Can Dent Assoc* 1988;54:271–274.
- Macfarlane TV, Blinkhorn AS, Davies RM, Kincey J, Worthington HV. Factors associated with health care seeking behaviour for orofacial pain in the general population. *Community Dent Health* 2003;20:20–26.
- Von Korff M, Lin EH, Fenton JJ, Saunders K. Frequency and priority of pain patients' health care use. *Clin J Pain* 2007;23:400–408.
- Dworkin SF, LeResche L. Research diagnostic criteria for temporomandibular disorders: Review, criteria, examinations and specifications, critique. *J Craniomandib Disord* 1992;6:301–355.
- Rollman A, Naeije M, Visscher CM. The reproducibility and responsiveness of a patient-specific approach: A new instrument in evaluation of treatment of temporomandibular disorders. *J Orofac Pain* 2010;24:101–105.
- van der Kloot W, Vertommen H. De MPQ-DLV: Een Nederlandse Versie van de McGill Pain Questionnaire. Achtergronden en Handleiding. Lisse: Swets & Zeitlinger, 1989.
- Lobbezoo F, Visscher CM, Naeije M. Impaired health status, sleep disorders, and pain in the craniomandibular and cervical spinal regions. *Eur J Pain* 2004;8:23–30.
- Visscher CM, Ohrbach R, van Wijk AJ, Wilkosz M, Naeije M. The Tampa scale for kinesiophobia for temporomandibular disorders (TSK-TMD). *Pain* 2010;150:492–500.
- Stomp-van den Berg SGM, Vlaeyen JWS, ter Kuile MM, Spinhoven P, van Breukelen G, Kole-Snijders AMJ. *Pijn Coping en Cognitie Lijst*. Maastricht: Pijn Kennis Centrum Maastricht, 2001.
- Arrindell W, Ertema J. *Handleiding bij een Multidisciplinaire Psychopathologie-indicator*. Lisse: Swets & Zeitlinger, 1986.
- Corah NL. Development of a dental anxiety scale. *J Dent Res* 1969;48:596.
- Schuurs AH, Hoogstraten J. Appraisal of dental anxiety and fear questionnaires: A review. *Community Dent Oral Epidemiol* 1993;21:329–339.
- van der Lugt CM, Rollman A, Naeije M, Lobbezoo F, Visscher CM. Social support in chronic pain: Development and psychometric assessment of a new instrument. *J Oral Rehabil* 2012;39:270–276.
- van der Meulen MJ, Lobbezoo F, Aartman IH, Naeije M. Ethnic background as a factor in temporomandibular disorder complaints. *J Orofac Pain* 2009;23:38–46.
- Wijnhoven HA, de Vet HC, Picavet HS. Sex differences in consequences of musculoskeletal pain. *Spine* 2007;32:1360–1367.
- Field A (ed). *Discovering Statistics Using SPSS*, ed 2. London: SAGE, 2005.
- Holbrook A, Green M, Krosnick J. Telephone versus face-to-face interviewing of national probability samples with long questionnaires. Comparison of respondent satisficing and social desirability response bias. *Public Opinion Quarterly* 2003;67:79–124.
- Asch DA, Jedrzejewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol* 1997;50:1129–1136.
- Macfarlane TV, Blinkhorn AS, Davies RM, Kincey J, Worthington HV. Oro-facial pain in the community: Prevalence and associated impact. *Community Dent Oral Epidemiol* 2002;30:52–60.
- Turner JA, Brister H, Huggins K, Mancl L, Aaron LA, True-love EL. Catastrophizing is associated with clinical examination findings, activity interference, and health care use among patients with temporomandibular disorders. *J Orofac Pain* 2005;19:291–300.
- Vlaeyen JW, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: A state of the art. *Pain* 2000;85:317–332.
- Schiffedercker KE, Reed VA. Using mixed methods research in medical education: Basic guidelines for researchers. *Med Educ* 2009;4:637–644.