

Factors Predicting Orofacial Pain Patient Satisfaction with Improvement

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Aims: To determine psychosocial predictors of patients' ratings of satisfaction with improvement and subjective pain relief. This study also examined the underlying components of patient satisfaction with improvement, as assessed at follow-up. **Methods:** The sample consisted of 107 chronic orofacial pain patients evaluated at a university-based orofacial pain clinic and referred for treatment with individualized treatment plans. Pain and psychosocial functioning were assessed with standard, reliable, validated self-report instruments administered at the initial evaluation. Follow-up data were collected via a telephone-administered structured interview 8 months after the initial evaluation. Regression methodology was used to determine prediction models for satisfaction with improvement and subjective pain relief. Patient ratings of the quality of the caregiver communication were used as a control variable in all analyses. **Results:** Quality of caregiver communication predicted approximately 10 to 14% of the variance in outcomes in all models. Greater initial use of cognitive coping strategies and reduced depression predicted higher ratings of satisfaction with improvement and increased pain relief. When concurrent relationships among variables at the follow-up were examined, greater subjective pain relief since the evaluation, lower current pain, and higher ratings of overall mood were significant predictors of patient satisfaction with improvement. **Conclusion:** This study is one of the first to report that the use of certain cognitive coping strategies is associated with positive outcome for patients suffering from orofacial pain. These findings underscore the importance of individual differences on behavioral and psychosocial parameters in the prediction of patients' subjective evaluation of treatment outcome.

J OROFAC PAIN 2001;15:29-35.

Key words: orofacial pain, patient satisfaction, treatment outcome, psychological adaptation, psychological distress

Patients' satisfaction with health care has been investigated in a broad array of contexts, including primary dental and primary medical care,¹⁻³ specialty clinics,⁴ and tertiary care centers.⁵ Broadly speaking, the data across settings suggest that patients' satisfaction with health care reflects objective treatment outcome variables, including treatment effectiveness, health behaviors, compliance with treatment, and symptom reduction.⁶⁻⁸ Patients' confidence in health care providers³ as well as their levels of somatic and psychologic distress⁹⁻¹¹ are among the predictors of their satisfaction with care. Dissatisfaction with treatment may prompt individuals to seek further consultation, evaluation, and diagnostic testing, increasing the probability that they may

undergo intrusive diagnostic procedures and add substantially to their financial burden. Patient dissatisfaction also has important financial and legal implications for health care providers.^{12,13} A clinician who obtains information from patients about their satisfaction with symptom improvement can be sensitive to patients' expectations and beliefs about specific areas of improvement they deem most important.

Although less well-documented, predictors of satisfaction in the chronic pain patient population appear to be similar to those in the medical population in general. For example, confidence in the health care provider and effective provider-patient communication emerge as strong predictors of patient satisfaction with treatment for chronic pain.^{4,6,14} This finding is consistent with results obtained in health care in general, where patients' satisfaction with treatment often hinges on the quality of the health care provider's explanation of the diagnosis, its associated symptoms, and treatment recommendations.⁷ The American Pain Society¹⁵ is promoting research into patient satisfaction and other subjective and objective outcomes of treatment for acute and chronic pain.

Relatively few studies have examined patients' satisfaction with the assessment or treatment of chronic orofacial pain. In one study, patients were mailed a satisfaction questionnaire immediately after their initial consultation appointment in a specialty craniofacial pain clinic. Although respondents reported high overall levels of satisfaction with the consultation, more than half of the patients were dissatisfied with communications, and one-fifth were dissatisfied with their diagnosis and treatment.¹⁶ Türp and colleagues¹⁷ examined information provided by new referrals about their satisfaction with past treatment received from other caregivers prior to their referral. Findings indicated only moderate satisfaction with prior treatment. No published studies are available addressing orofacial pain patients' satisfaction with their improvement over the time period from the initial consultation to a later, posttreatment follow-up consultation.

The purposes of the current study were as follows: (1) to examine predictive relationships between prospectively measured psychosocial factors obtained at the initial evaluation and patients' subjective satisfaction with improvement from pre-treatment to the time of posttreatment follow-up; (2) to examine relationships between prospectively measured psychosocial factors and subjective pain relief at follow-up; and (3) to assess relationships between subjective satisfaction with improvement

at the time of follow-up and other outcome measures assessed at follow-up (rating of current pain, physical activity level, and psychologic distress) that have previously been reported to be associated with patient satisfaction.

Materials and Methods

Participants were 107 patients who underwent multidisciplinary (dental, psychologic, and physical therapy) assessments of orofacial pain at the Parker Mahan Facial Pain Center at the University of Florida. Eighty-eight female and 19 male patients, with an average age of 42.9 years (SD 14.1, range 24 to 79) and an average of 13 years (SD 2.2) of formal education, participated. Most participants (73%) were married. The average length of time between onset of orofacial pain and date of evaluation was 59.1 months (SD = 76.3). The 107 respondents represented a subset of 140 consecutive new patients evaluated at the Facial Pain Center, 4 of whom were excluded from the study on the basis that no treatment recommendations were made to them, and 29 of whom could not be reached for follow-up interviews. None of the patients who were successfully contacted declined to be interviewed. There were no significant demographic differences between patients who participated in the study and those who did not. Following evaluation, these patients were referred to the appropriate health care professional with a personalized treatment plan, which typically included changes in medication regimen, splint therapy, psychologic counseling, and/or physical therapy.

Initial data were collected at the Facial Pain Center during the course of each patient's daylong evaluation visit. To facilitate measurement of the complex, multidimensional experience of chronic pain, subscales were selected from standard, reliable, validated self-report measures regularly used in the assessment of psychosocial functioning of patients with chronic pain. Dimensions assessed included pain report, depressive symptoms, anxiety, cognitive coping strategies, and reduction in physical activity, as assessed by the following self-report instruments administered at the initial evaluation.

- McGill Pain Questionnaire (MPQ).¹⁸ The MPQ yields subscale scores for the sensory (MPQ-SEN), affective (MPQ-AFF), and evaluative dimensions of pain. The sensory and affective subscales were included in the analyses.

- Coping Strategies Questionnaire—Revised (CSQ-R).^{19,20} The CSQ-R is a self-report questionnaire designed to assess coping responses to pain. Three subscales were included in the analyses—distancing from pain (CSQ-R DIS), coping self-statements (CSQ-R CSS), and ignoring pain (CSQ-R IP)—because previous research has shown these scales to form a cognitive coping factor.¹⁹
- Beck Depression Inventory (BDI).²¹ The BDI is a widely recognized measure of depression used to assess the extent to which an individual currently reports behaviors, thoughts, or affective or somatic symptoms commonly associated with depression.
- State-Trait Anxiety Inventory (STAI).²² The STAI is a 40-item self-report measure with subscales that assess state anxiety symptoms (ie, current anxiety level) (STAI-S) and general constitutional anxiety symptoms (STAI-T).²³
- Multidimensional Pain Inventory (MPI).²⁴ Four subscales of the MPI—household chores (MPI-HC), activities away from home (MPI-AA), social activities (MPI-SA), and outdoor work (MPI-OW)—were used to assess how much the patient's pain had interfered with the ability to function in vocational, social, family, recreational, and outdoor activities.

Follow-up data were collected via a telephone-administered structured interview 8 months after the initial evaluation. Patients were informed that the caller was from the Facial Pain Center at the University of Florida and was not one of the clinical staff involved in the evaluation. Patients were asked to participate in a telephone interview inquiring about their pain condition and about their subjective evaluation of the outcome from the care they had received. Measures obtained during the follow-up interview were as follows:

- *Satisfaction with improvement* was measured as the composite score of the following 2 items: “On a scale of 0 to 10, I would like you to rate your overall improvement since your evaluation, 0 being no improvement and 10 being complete improvement”; and “On a scale of 0 to 10, I would like you to rate your level of satisfaction with your improvement since the evaluation, 0 being totally unsatisfied and 10 being completely satisfied.” The correlation ($r = 0.86$, $P < 0.05$) between items reflecting subjective outcome (“rate your overall improvement since your evaluation” and “rate your level of satisfaction with your improvement since the evaluation”) supported the decision to form a composite variable, *satisfaction with improvement*,

from these 2 items, because the creation of a composite measure from 2 related items yields a more reliable measure of the underlying construct than would be produced from the use of a single indicator.

- *Quality of caregiver communication* was operationalized as the composite of the following 3 questions, each of which was measured on a 0 to 10 scale: (1) “How well was your diagnosis explained to you at the Facial Pain Clinic, 0 = the diagnosis was not clearly explained, 10 = the diagnosis was very clearly explained?”; (2) “Do you agree with your diagnosis, 0 = total disagreement with the diagnosis, 10 = total agreement with the diagnosis?”; and (3) “Do you agree with the recommendations, 0 = total disagreement with the recommendations, 10 = total agreement with the recommendations?” Intercorrelations among the 3 ratings of communication supported a composite scoring scheme for the construct of quality of caregiver communication (how well diagnosis was explained, item 10; rating of agreement with diagnosis, item 11; and agreement with the recommendations, item 18; $r_{10,11} = 0.86$, $P < 0.05$; $r_{10,18} = 0.62$, $P < 0.05$; $r_{11,18} = 0.78$, $P < 0.05$). This variable was included as a control variable in regression analysis involving subjective ratings of outcome by patients.⁷
- *Pain* was operationalized in 2 ways in the follow-up interview. Average *current pain* was defined as the patient's response to the following: “Rate your average level of pain for the past week on a scale of 0 to 10, 0 being no pain and 10 being the worst pain imaginable.” *Pain relief* was defined as the patient's response to the following: “Rate the pain relief you have experienced since your evaluation on a scale of 0% to 100%, 0% being no pain relief and 100% being complete relief.”
- *Physical functioning* was assessed by the patient's responses to the physical functioning subscale from the 36-Item Short Form Health Survey (SF-36),²⁵ which measures the degree of health-related limitation in several common activities.
- *Psychologic distress* was operationalized 2 ways. *Anxiety* was measured as the response to the question, “During the past week, how anxious or tense have you been, on a scale of 0 to 10, 0 being not at all anxious and 10 being extremely anxious?” *Mood* was measured as the patient's response to the request, “Please rate your overall mood during the past week on a scale of 0 to 10, 0 being extremely low mood and 10 being extremely high mood.”

Table 1 Hierarchical Regression Analysis of Initial Psychosocial Variables as Predictors of Satisfaction with Improvement

Predictors	B (SE)	Standardized beta	ΔR^2	R^2	<i>t</i> value	<i>P</i> value
Control variable						
Caregiver communication	0.350 (0.143)	0.301		0.121	3.012	0.001
Psychosocial status variables						
CSQ-R cognitive coping	2.963 (1.135)	0.314	0.184	0.305	2.611	0.009
BDI total score	-2.965 (1.149)	-0.320			-2.580	0.013
MPQ total score	-0.892 (1.052)	-0.109		-0.848	0.400	
MPI activity score	-0.256 (1.109)	-0.031			-0.251	0.803
STAI total score	0.087 (0.907)	0.001			0.010	0.992

B = Unstandardized regression coefficient; SE = standard error.

Table 2 Hierarchical Regression Analysis of Initial Psychosocial Variables as Predictors of Pain Relief

Predictors	B (SE)	Standardized beta	ΔR^2	R^2	<i>t</i> value	<i>P</i> value
Control variable						
Caregiver communication	1.487 (0.538)	0.249		0.099	2.763	0.007
Psychosocial status variables						
CSQ-R cognitive coping	20.964 (4.130)	0.450	0.244	0.343	5.076	0.000
BDI total score	-4.426 (4.160)	-0.296			-3.468	0.001
MPI activity score	-3.349 (3.553)	-0.081			-0.943	0.348
STAI total score	1.402 (3.348)	0.035			0.419	0.676
MPQ total score	-0.655 (3.669)	-0.016			-0.178	0.859

B = Unstandardized regression coefficient; SE = standard error.

Analytic Strategy

Hierarchical regression analyses were conducted with SPSS software to test longitudinal relationships between initial psychosocial factors and outcome variables at follow-up, and the concurrent relationship at follow-up between psychosocial factors and satisfaction with improvement. Patient ratings of the quality of caregiver communication were forced into the regression models first to control for potential bias associated with this rating. Also, in the concurrent analysis, initial pain was controlled. Statistical significance was set at $P < 0.05$.

Results

To rule out the possibility of age or duration of pain as potential confounding variables in the subsequent analyses, correlation coefficients were calculated between these variables and the dependent variables. No relationships were significant at $P < 0.05$.

Patients' Satisfaction with Improvement

To test whether patients' responses to psychosocial measures at the initial evaluation predicted satisfaction with improvement at the time of follow-up, the composite satisfaction with improvement variable was regressed on the total scores from the subscales of the self-report instruments administered at the initial assessment (MPQ, CSQ-R, BDI, STAI, MPI). The quality of caregiver communication rating was entered first in the hierarchical regression model to control for potential bias. The results (Table 1) indicated that the quality of caregiver communication predicted 12.1% of the variance in satisfaction with improvement. The total score of the 3 CSQ-R subscales was entered with the BDI total score as a second block of the hierarchical model, and together these psychosocial status variables were found to be significant predictors of satisfaction with improvement, with an R^2 for the model of 0.305, $F = 7.569$, $P = 0.001$.

Subjective Pain Relief at Follow-up

When the follow-up ratings of pain relief on the psychosocial domains assessed at the initial evalua-

Table 3 Hierarchical Regression Analysis of Follow-up Variables as Predictors of Satisfaction with Improvement

Predictors	B (SE)	Standardized beta	ΔR^2	R^2	<i>t</i> value	<i>P</i> value
Control variables						
Caregiver communication	0.506 (0.270)	0.363		0.145	3.454	0.000
MPQ total score*	-0.787 (1.867)	-0.082			-0.421	0.677
Psychosocial status variables						
Pain relief	0.128 (0.027)	0.637	0.624	0.769	7.456	0.000
Current pain	-0.832 (0.325)	-0.346			-2.561	0.019
Mood	-0.694 (0.312)	-0.188			-2.227	0.035
Anxiety	-0.639 (0.314)	-0.216			-2.035	0.055
Physical functioning	-0.023 (0.027)	-0.097			-0.854	0.403

*MPQ total score from initial assessment was added to control for initial pain.
B = Unstandardized regression coefficient; SE = standard error.

tion were regressed, the results (Table 2) indicated that the quality of caregiver communication predicted 9.9% of the variance in pain relief. In block 2, the CSQ-R and BDI were significant predictors of pain relief, with an R^2 for the model of 0.343, $F = 9.966$, $P < 0.001$.

Concurrent Predictors of Satisfaction with Improvement

To test which follow-up status variables were most associated with concurrent patient satisfaction with improvement, multiple regression was performed with the composite overall satisfaction with improvement measure as the dependent variable. The quality of caregiver communication and the MPQ total score from the initial assessment were entered in the first block as control variables, and the concurrent status variables, assessed at follow-up, were entered in the second block. The results (Table 3) indicated that the quality of caregiver communication and initial MPQ pain score predicted 14.5% of the variance in satisfaction with improvement. In block 2, pain relief, current pain, and mood were significant predictors of satisfaction with improvement. The R^2 for the full model was 0.769, $F = 20.872$, $P = 0.000$.

Discussion

This study examined prospective psychosocial predictors of patients' ratings of satisfaction with improvement after multidisciplinary assessment and treatment for chronic orofacial pain. Higher pretreatment use of cognitive coping strategies and reduced levels of depressive symptomatology predicted higher ratings of satisfaction with improve-

ment and pain relief at follow-up 8 months later. Neither activity level nor pain level measured prior to treatment predicted patients' satisfaction with improvement or pain relief. These findings underscore the importance of considering cognitive and affective factors in this patient population. Patients' responses during the follow-up interview also provided important information about the areas of improvement that they deemed most salient in making judgments of relative improvement.

The current findings regarding coping are consistent with past research in an array of chronic pain conditions, wherein cognitive coping strategies have been associated with pain-related adjustment in general,²⁶ including physical functioning, psychological distress,²⁷ and self-efficacy for pain coping.²⁸ However, these associations have been demonstrated at a single point in time, rather than across time. The present results indicated that patients who used more coping self-statements, ignored pain, and distanced themselves from pain were more satisfied with improvement at the follow-up time-point 8 months later, in comparison to patients who did not employ these particular cognitive strategies. The prospective nature of the current findings renders strong evidence that use of these cognitive strategies is adaptive for patients experiencing chronic orofacial pain. A logical clinical implication might be that training patients to increase their use of cognitive coping would lead to greater satisfaction with improvement and pain reduction. However, the actual mechanism is unclear, as there is evidence from treatment outcome studies that increasing orofacial pain patients' use of cognitive coping strategies chiefly affects mood and is only modestly associated with a reduction in pain symptoms.^{29,30} Careful delineation of individual differences before treatment

not only on disease parameters but also on behavioral and psychosocial parameters such as coping will likely improve clinicians' ability to predict patients' subjective evaluation of treatment outcome and should help refine treatment protocols so that they target the needs of subgroups of patients who differ on these dimensions.^{31,32}

In the current study, patients with higher pre-treatment levels of depression showed less satisfaction with improvement and less pain relief at follow-up. It is possible that reduced satisfaction with improvement is a by-product of reduced compliance with treatment recommendations, consistent with evidence that psychologically distressed chronic orofacial pain patients are at increased risk for poor compliance to recommended treatment regimens.³³ Previous research^{23,34} has found that depression mediates the relationship between pain level and the psychosocial and physical functioning of patients with chronic orofacial pain. Although questions concerning temporal and causal relationships between the onset of pain and the onset of depression are unresolved, there is little debate over the high prevalence of depressive illness among patients presenting with chronic pain.³⁵ Turk and colleagues³² have empirically demonstrated the benefit of directly targeting initial depression through psychologic intervention as part of multidisciplinary treatment for chronic temporomandibular disorders when patients present with high levels of affective distress. These studies highlight the importance of adequately assessing psychopathology in this patient population to ensure appropriate treatment recommendations.³⁶

To determine the underlying components of patient satisfaction with improvement, we examined relationships between the variables assessed at follow-up and the ratings of satisfaction with improvement. Higher ratings of the quality of caregiver communication predicted patient satisfaction with improvement. This finding is consistent with the literature on patient satisfaction with health care generally, where the quality of the caregiver-patient interaction is consistently found to be of great importance in subjective evaluations.⁷ Subjective pain relief since the initial evaluation, current pain, and current mood also emerged as significant predictors of satisfaction with improvement, even when baseline levels of pain were controlled. Health-related limitation in common activities did not predict patients' satisfaction with improvement. Pain relief accounted for the greatest portion of patients' satisfaction with improvement, suggesting that patients may largely define improvement as pain reduction. The

patients' definition of improvement may therefore be narrower than the clinician's definition, which is likely to include improved physical functioning.

Evaluation of patients' satisfaction with health care in general is still at a formative stage, and research into patients' satisfaction with treatment for chronic orofacial pain is in its infancy. Many important questions remain about patients' satisfaction with changes in specific aspects of the experience of chronic pain, such as satisfaction with improvement. LeResche³⁷ has delineated key physical and behavioral aspects of the experience of chronic pain that are typically targeted in treatment and are therefore important to assess as outcomes of treatment. These areas include nociception, pain perception, appraisal of the meaning of pain, pain-related behavior, and social role functioning. Future research regarding patient satisfaction may very usefully target patient satisfaction with improvement in any or all of these domains.

There are 2 methodologic issues that should be considered in the interpretation of the present findings. First, it is possible that the use of the term "improvement" (as in the term "satisfaction with improvement") in the follow-up interview questions may potentially have been confusing to patients, particularly if they did not perceive their condition to have improved. However, this is unlikely, because the question specifically included an option of no improvement. Patients were asked the following question: "On a scale of 0 to 10, I would like you to rate your overall improvement since your evaluation, 0 being no improvement and 10 being complete improvement." A second potential limitation stems from the fact that the scale for improvement ranged from "no improvement" to "complete improvement" and did not provide patients with a response option indicating that their condition had worsened.

The current study is the first to report prospective predictors of satisfaction with improvement after treatment for chronic orofacial pain. Consistent with other studies, we found that the quality of caregiver-patient communication is an important variable in patient satisfaction with improvement. This study is one of the first to report that patients who seek treatment and already use certain cognitive coping strategies tend to be more satisfied with improvement at follow-up, suggesting that these coping strategies are adaptive for chronic pain patients. These findings also underscore the importance of considering behavioral, cognitive, and affective factors in the research, clinical assessment, and treatment of this patient population.

Acknowledgments

This investigation was partially supported by NIH grants DE-07283 and 1P20DE12396-01.

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