

# Long-term Outcomes of Shamanic Treatment for Temporomandibular Joint Disorders

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## Abstract

**Background:** Temporomandibular joint disorders (TMDs) are chronic, often refractory, pain conditions affecting the jaw and face. Patients least likely to respond to allopathic treatment have the most marked biologic responsiveness to external stressors and concomitant psychosocial and emotional difficulties. From a shamanic healing perspective, this describes individuals who are thought to be “dispirited” and may benefit from this ancient form of spiritual healing.

**Objective:** To report on the long-term quantitative and qualitative outcomes relative to end-of-treatment status of a phase I study that evaluated the feasibility and efficacy of shamanic healing for people with TMDs.

**Methods/Design:** Participants were contacted by telephone at one, three, six, and nine months after treatment and asked to report pain and disability outcomes and qualitative feedback.

**Setting:** Portland, OR.

**Participants:** Twenty-three women aged 25 to 55 years diagnosed with TMD.

**Primary Outcome Measures:** Participants rated their TMD-related pain and disability (on the TMD Research Diagnostic Criteria Axis II Pain Related Disability and Psychological Status Scale) at each follow-up call and were asked to describe their condition qualitatively.

**Results:** Improvements in usual pain, worst pain, and functional impairment reported at end of treatment did not change during the 9 months after treatment ended ( $p > 0.18$ ).

**Conclusion:** Shamanic healing had lasting effects on TMDs in this small cohort of women.

## Introduction

Temporomandibular joint disorders (TMDs) are chronic, recurrent, nonprogressive pain conditions affecting the temporomandibular joint and surrounding tissues.<sup>1-4</sup> TMDs are primarily found in young and middle-aged adults and are nearly twice as prevalent in women.<sup>5,6</sup> Individuals with TMD may experience a range of symptoms, including facial pain, jaw-joint pain, headaches, earaches, dizziness, limited ability to open the mouth, and clicking or popping in the jaw joint. In addition to the physical pathology associated with TMDs, many patients with TMD exhibit a range of physical comorbidities such as gastrointestinal symptoms, frequent infections,

and fibromyalgia, as well as psychological comorbidities such as stress, depression, and anxiety.<sup>5,7-9</sup>

Clinical evidence indicates that psychosocial stressors play a role in the clinical course of TMD<sup>7</sup> and can predict the outcome of symptomatic treatment.<sup>8,10</sup> Twenty percent to 30% of patients nonresponsive to standard allopathic treatment appear to have more complex psychosocial problems, including severe depression.<sup>8,11-15</sup> Several studies that combine symptomatic treatment (splint therapy and pain medication) with biobehavioral treatments suggest that therapies that attend to both mind and body may be essential to providing symptomatic relief for individuals with chronic TMDs.<sup>16,17</sup> Complementary and alternative medicine (CAM) treatments, including shamanic healing, may be appropriate for people with chronic illnesses, such as TMDs, that elude conventional treatment.

Shamanic healing is an ancient and widespread form of spiritual healing that focuses on illness (ie, the patient’s experience of their disorder), which can be influenced by both biology and the sociocultural context of the disorder.<sup>18</sup> In the shamanic worldview, illnesses may be due to both spiritual and nonspiritual factors.<sup>18-23</sup> Shamans worldwide believe all living beings have a soul—the vital essence required for life.<sup>19,21,23,24</sup> The soul is the spiritual, nonphysical part of us that is the center of our emotions, feelings, and spirit. Part of this vital essence can “split away” when there is trauma (eg, an accident or loss of a loved one). A person suffering from soul loss may feel dead inside, suffer memory gaps, experience out-of-body or listless feelings, or have frequent physical illnesses. For a shamanic practitioner (SP), it is important to find those essences that have split away, help them to heal, and bring them back into the person to help make him/her whole again.<sup>19</sup> Although the client may express their experience of shamanic healing to the SP, the SP encourages the client to experience the changes quietly; clients need not describe their experience to the SP. In contrast, contemporary psychology recognizes the phenomenon of dissociation, when people split off from their body at times of stress. In this context, the client is helped to regain and sometimes describe the lost experience and can be healed.<sup>25</sup>

Shamans recognize two realities reflecting an individual’s state of consciousness. People in the ordinary state of consciousness perceive ordinary reality; those in the shamanic

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state of consciousness enter into and perceive nonordinary reality. SPs in contemporary Western practice enter the shamanic state of consciousness through the use of sonic driving (drumming or rattling).<sup>26-30</sup> Entrance into nonordinary reality and experiences while in this state comprise a shamanic journey. Shamans, by definition, are individuals who journey with discipline in nonordinary reality with the specific intent of helping others.<sup>19,21,24,31</sup>

The primary task of the SP is to help restore wholeness to the individual or community. SPs use their connection with helping spirits to clear out blocking, or negative, intrusive energy (extraction), bring back soul essences lost during trauma or illness (soul retrieval), and engage in spiritual healing (guided visualizations, ritual, etc).<sup>19,32</sup> The shaman's preverbal imagery for treating health problems may permit the client's imagination to act directly upon the physical substrate of tissues, organs, and cells through a system of biologic communication that evolved before language.<sup>23,33-35</sup> This healing information and energy is transmitted to the participant through verbal and nonverbal communication.

Shamanic healing is interactive, enabling individuals to regain their power and participate in their own healing. An individual need not be an SP to learn to journey, although simply learning to journey does not qualify one to be an SP.

In a previous study<sup>36</sup> examining the effect of various CAM treatments on TMDs, the authors (NV, JS) found that, in addition to having physical symptoms of TMDs, study participants shared other characteristics. They had a great deal of stress and often indicated a sense of being dispirited—commonly described as not feeling “present in my body”—or expressed that something was missing. These symptoms are consistent with soul loss, a condition treatable within the paradigm of shamanic healing.<sup>19,32</sup>

Anthropologists have traditionally focused their studies of shamanism on the shamans' belief systems, healing practices, and role in their communities.<sup>19,21,24,37-39</sup> Other studies have focused on physiologic changes that accompany the shamanic journey and use of sonic drumming.<sup>26-30,40</sup> Although there are a few retrospective, descriptive studies in which people described their experience of shamanic healing, before our study, no clinical trial of shamanic healing had ever been recorded.<sup>19,41,42</sup>

Drawing on these observations, the study authors designed a phase I clinical trial to assess the feasibility of treating TMDs with shamanic healing. The short-term clinical outcomes (from baseline to final treatment) have been reported elsewhere.<sup>43</sup> In brief, at the final treatment visit, we found significant decreases from baseline in three primary outcome measures: usual pain ratings declined from 4.96 to 2.70,  $p < 0.0001$ ; worst pain from 7.48 to 3.60,  $p < 0.0001$ ; and functional impact of TMD from 3.74 to 1.15,  $p < 0.0052$ . The results of qualitative interviews, in which participants described a process of transformation that included changes in self-awareness, capacity for coping, and improvement in relationships as a result of shamanic treatment, are described elsewhere.<sup>44</sup> This article describes the long-term clinical outcomes, from the end of treatment to 9 months after the shamanic treatment intervention ended.

## Methods Overview

In the intervention phase of the study,<sup>43</sup> 20 women with diagnosed TMDs were randomly assigned to an SP and completed 5 visits with that practitioner. During the 5 visits, the SP brought back healing information and used shamanic treatments, such as soul retrieval, extraction, and guided meditation, to facilitate healing in the

**The primary task of the SP is to help restore wholeness to the individual or community.**

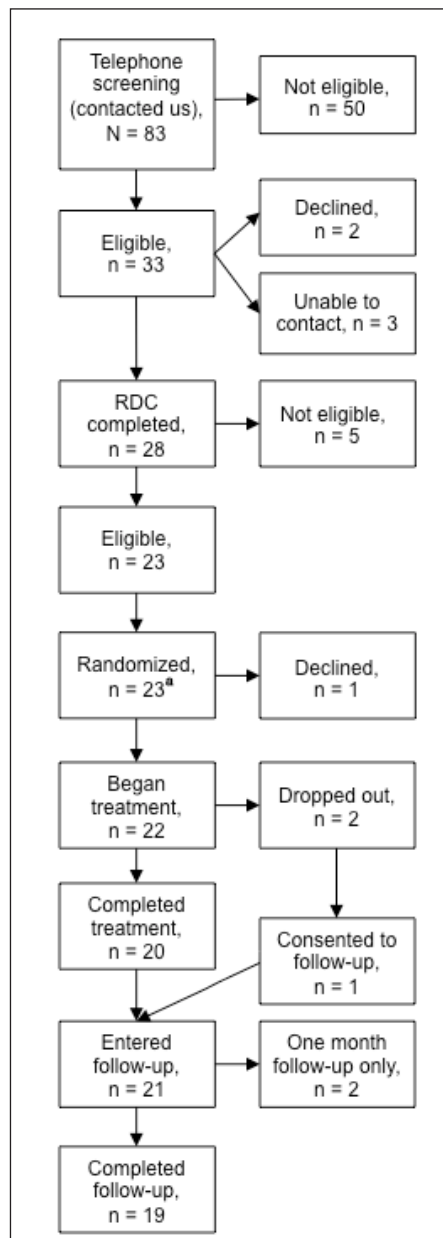


Figure 1. Consort Diagram.

<sup>a</sup> One participant was randomized in error and excluded when error was discovered.

participant. At each visit the participant completed a pain questionnaire. Because shamanic healing had never before been evaluated in a clinical trial, we designed this phase I project as a feasibility study and therefore did not include a control group.

Participants were interviewed by telephone at one, three, six, and nine months after the five visits. We attempted to follow up all eligible and enrolled participants, regardless of whether treatment was completed. The participants were informed at the beginning of the study that they would be contacted up to nine months after the visits to the SP. This study was approved by the institutional review board of Kaiser Permanente Northwest, the institutional home of The Center for Health Research-Northwest.

### Participants

Participants were recruited from the general population of Portland, OR, by means of newspaper advertisements and flyers. Twenty-three participants were enrolled in the intervention phase of the study (Figure 1). All were women aged 25 to 55 years (mean, 38.3; standard deviation 8.3) who were identified as having a diagnosis of TMD (based on the Research Diagnostic Criteria exam)<sup>45</sup> and a usual pain level of 3 or greater on the 10-point Research Diagnostic Criteria pain scale. Because we sought to identify participants with complicated TMDs, an additional eligibility criterion was 2 or more of the following self-reported chronic conditions in the past 2 years: fibromyalgia; chronic fatigue syndrome; depression; stomach or intestinal problems (eg, ulcers, irritable bowel, and Crohn's disease); reproductive problems (eg, endometriosis, fibroids, and menstrual problems); upper respiratory problems (eg, asthma and chronic bronchitis); or chronic headaches or migraines. Complicated, chronic TMDs

are characterized by the presence of one or more of these comorbidities.<sup>1,45</sup> None of the participants had received previous shamanic treatment.

### Providers

The SPs were all women who had an active contemporary Western shamanic healing practice for at least two years in the Portland, OR metropolitan area. The authors purposely chose SPs trained in a Western form of shamanic practice to increase the cultural acceptability<sup>46</sup> of the shamanic intervention for women participants drawn from a North American, urban setting. The authors required that the SPs were trained in the core elements of shamanism at Michael Harner's Foundation for Shamanic Studies, and in soul retrieval by Sandra Ingerman,<sup>19</sup> under Foundation sponsorship. In addition, the SPs had trained on their own with other SPs and indigenous shamanic teachers. None of the SPs had previously participated as providers in a clinical trial.

### Materials/Methods

After completing five visits with an SP, the participants were contacted by telephone four times, at one, three, six, and nine months after treatment, to rate their TMD-related pain and disability and to report qualitative changes (Table 1).

One trained clinical interviewer carried out all of the telephone interviews to establish a rapport with the participants and to maintain consistency in data collection. During these interviews, each participant rated facial pain on a standardized scale. The 2 pain measures are 11-point scales, where the lowest value (0) represents "no pain" and the highest value (10) represents "pain as bad as it could be." The 11-point functional impairment scale asks how much the TMD-related pain interferes with daily activities, with ratings

**Table 1. Follow-up questionnaire for telephone interviews at 1, 3, 6, and 9 months after treatment<sup>1</sup>**

1	In the <i>last week</i> , how intense was your <b>worst</b> TMD-related pain, rated on a 0 to 10 scale, where 0 is "no pain" and 10 is "pain as bad as could be"?
2	In the <i>last week, on average</i> , how intense was your TMD-related pain, rated on a 0 to 10 scale, where 0 is "no pain" and 10 is "pain as bad as it could be"?
3	In the <i>last week</i> , how <i>improved</i> was your TMD-related pain, rated on a 0 to 10 scale, where 0 is "much worse," 10 is "much improved," and 5 is "no change"?
4	In the <i>last week</i> , how much has TMD-related pain <i>interfered</i> with your daily activities, rated on a 0 to 10 scale, where 0 is "no interference" and 10 is "unable to carry out activities"?
5	In the <i>last week, on average</i> , how intense was other pain, rated on a 0 to 10 scale, where 0 is "no pain" and 10 is "pain as bad as it could be"?
6	Did you take any medications for your pain last week?
7	What changes have you noticed [at 1 month] since you ended treatment in the study? [At 3, 6, 9 months] Since the last time we talked to you?
8	[At 1 month] Since completing treatment in the study, have you had any additional shamanic treatment? [At 3, 6, 9 months] Since the last time we talked, have you had any additional shamanic treatment?
9	[At 1 month] Since completing treatment in the study, have you learned to journey? [At 3, 6, 9 months] Since the last time we talked, have you learned to journey?
10	Has anything else in your life changed as a result of the treatment (ie, sleep, exercise, energy, other conditions, feel more at ease/balanced, feel differently about things, etc)?

<sup>1</sup> Dworkin SF, LeResche L. Research diagnostic criteria for temporomandibular disorders: review, criteria, examinations and specifications, critique. *J Craniomandib Disord* 1992 Fall;6(4):301-55.

TMD = temporomandibular joint disorders.

from “no interference” (0) to “unable to carry out activities” (10). Self-report is the gold standard for assessment of pain syndromes<sup>47</sup> (Table 1).

Each participant was asked to describe any changes that had occurred since the last study contact using standard qualitative assessment probes. Each participant was also asked whether she had received any additional shamanic treatment or had learned to journey (Table 1).

### Outcome Measures

The measures of long-term treatment effects were patient ratings of usual pain, worst pain, and functional impact of TMDs on subscales of the Research Diagnostic Criteria Axis II Pain-Related Disability and Psychological Status Scale.<sup>45</sup> These outcome measures were collected during each telephone interview and each treatment visit.

### Statistical Analysis

Data were reviewed for missing and out-of-range data and corrected as needed. We checked to see if the distributional assumptions of the planned analyses were met, and if they were not, we transformed the data as needed to meet those assumptions.

Efficacy was evaluated on the basis of changes in self-reported symptoms relevant to TMDs from end of treatment to end of follow-up (a maximum of 5 repeated measures per participant). We hypothesized that outcomes would show a worsening trend toward pretreatment (baseline) levels, as often occurs with chronic pain interventions. The primary test of change was on the slope of ratings from end of treatment to month 9. We estimated this change using a repeated measures multilevel mixed model (SAS Proc Mixed 8.2 SAS Institute, Cary, NC), with a spatial power covariance structure to adjust for dependency between measures for each subject. The restricted maximum likelihood algorithm in PROC MIXED uses all available subjects, despite gaps in follow-up. Because this was a pilot study, we set  $\alpha$  at 0.05 and did not adjust for multiple comparisons.

Finally, we evaluated whether participant outcomes might depend on which SP provided treatment. This analysis was also a repeated measures mixed model, with SP added as an experimental factor and baseline score on the corresponding outcome measure as a covariate. If the SP effect was significant, we tested differences between pairs of SPs on the participant-within-SP means in the same mixed model.

Variable	Randomized (n = 23)	Entered follow-up <sup>a</sup> (n = 21)
Mean age (SD), years	38.3 (8.3)	39.5 (8.3)
Education, %		
Less than college degree	39.1	33.3
College graduate or higher	60.9	66.7
Income, %		
\$0–\$14,999	39.4	42.9
\$15,000–\$49,999	34.8	28.6
\$50,000 or more	26.1	28.6
Marital status, % <sup>b</sup>		
Single	45.4	55.0
CAM therapy, n (SD)		
For TMD	4.3 (2.8)	4.1 (2.8)
For other conditions	8.7 (4.1)	8.6 (4.2)
Allopathic treatments, n (%)		
For TMD	1.8 (1.3)	1.8 (1.3)
Overall health, %		
Excellent/very good	17.4	19.1
Good/fair	82.6	80.9

<sup>a</sup>One person who dropped out of treatment agreed to follow-up.

<sup>b</sup>One missing.

CAM = complementary and alternative medicine; SD = standard deviation;

TMD = temporomandibular joint disorders.

### Qualitative Analysis

Participants' responses to questions 7 to 10 (Table 1) were reviewed by 2 of the authors (JS, MR) trained in qualitative analysis methods. Using an iterative process of coding, discussion, and review,<sup>48-51</sup> participant responses were grouped into 2 main themes of interest: 1) change in TMD symptoms; and 2) reported changes in psychosocial well-being. Applying a matrix coding process<sup>49,52,53</sup> to these 2 main themes yielded 5 categories of participant experience.

### Results

#### Data Completeness

Of the 23 participants who entered treatment, 20 completed the full course of 5 treatment visits. In addition, 1 participant who dropped out of treatment agreed to long-term follow-up and was included in the follow-up analyses. However, 2 participants dropped out after the first telephone

Outcome <sup>a</sup>	Baseline, mean (SD)	End of Treatment, mean (SD)	End of follow-up, mean (SD)
Usual pain score	4.96 (1.33)	2.70 (2.20)	2.00 (2.00)
Worst pain score	7.48 (1.41)	3.60 (2.52)	3.42 (2.50)
Functional impact of TMD	3.74 (3.15)	1.15 (2.25)	1.11 (1.88)

<sup>a</sup> Measured on the TMD Research Diagnostic Criteria Axis II Pain Related Disability and Psychological Status Scale.<sup>45</sup> SD = standard deviation; TMDs = temporomandibular joint disorders.

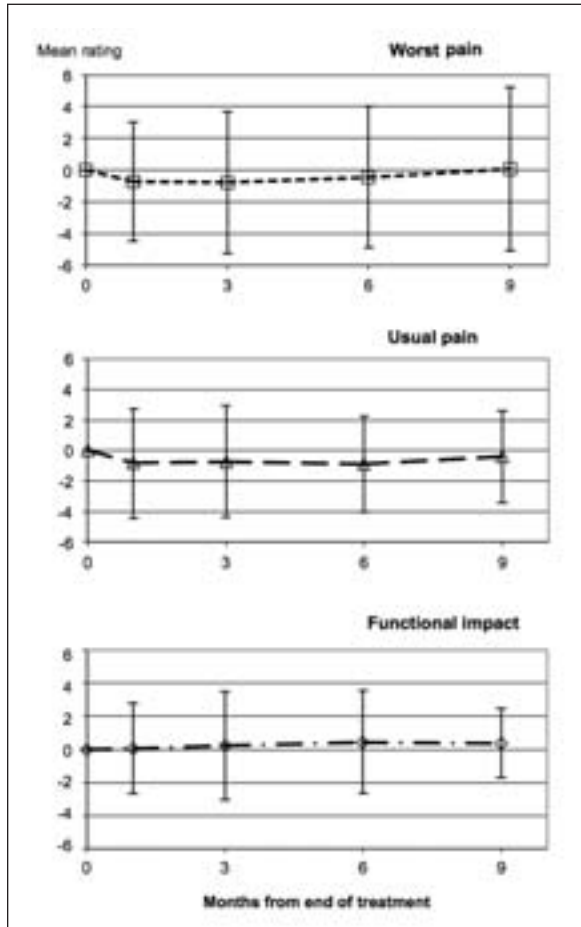


Figure 2. Means of participants' pain ratings from end of treatment through 9-month follow-up (bars, 95% confidence interval).

interview (at 1 month), leaving 19 who participated in the final interview (at 9 months). Table 2 compares characteristics of the participants who entered the trial with characteristics of those who entered follow-up.

**Treatment Effects over Time**

As reported previously, levels of pain and functional impact of disease decline significantly from baseline to end of

treatment.<sup>43</sup> Pain measures continued to show nonsignificant declines from end of treatment to nine months after treatment ended. Table 3 presents mean outcome measures at baseline, at the end of treatment, and at the end of follow-up. The raw means and standard deviations from end of treatment through the four follow-up interviews show no detectable change (Figure 2). Table 4 presents the results of the mixed-model analysis of outcomes for usual pain, worst pain, and functional impact. In every case, the slope over follow-up visits does not differ from zero. This analysis suggests that improvements experienced during treatment persisted for at least nine months following treatment.

**Shamanic Practitioner Effect**

We found a significant difference between SPs in the mean posttreatment self-ratings of their assigned participants, after adjusting for the corresponding baseline mean ( $p < 0.0001$ ). Our comparisons between SPs revealed that one SP differed significantly from the other 3 in posttreatment mean. However, the overall slopes over time did not differ between SPs. This indicates that the magnitude of the differences between the SPs did not change during the follow-up period. Also, the null effect found for slope over time in the primary model was observed after adjusting for SP differences. We found the same pattern of results for all 3 outcome measures.

**Changes Reported in Qualitative Data**

At all 4 assessments, 19 of the participants provided responses to additional exploratory questions about their shamanic treatment experience and any changes in TMD status or other areas of well-being (Table 1). Our qualitative data revealed that the majority of participants consistently reported some positive ongoing benefit to their TMD symptoms, psychosocial state, or both that they perceived to be a result of shamanic healing. On the basis of these responses and our qualitative analysis approach described above, 5 categories of participants were defined.

*No TMD symptoms and consistent positive changes in psychosocial well-being:* Three women reported that their TMD symptoms were "nil" or "not on their mind." They also reported positive changes in their overall well-being, such as feeling "more balanced" and "more calm" and "at peace."

*TMD symptoms still perceptible but improved, and con-*

Table 4. Estimated rate of change (slope) in primary outcomes, from end of treatment through nine months follow-up					
Dependent variable <sup>a</sup>	Slope estimate	Standard error	Degrees of freedom	t	Probability
Usual pain	0.046	0.054	18	0.85	0.4071
Worst pain	0.106	0.077	18	1.38	0.1851
Functional impact of TMD	0.038	0.049	18	0.79	0.4381

<sup>a</sup> Measured on the TMD Research Diagnostic Criteria Axis II Pain Related Disability and Psychological Status Scale.<sup>45</sup> TMD = temporomandibular joint disorder.

*sistent, positive changes in psychosocial well-being:* Eleven women reported improvement in their TMD symptoms across follow-up interviews. Although they still had some symptoms, many attributed their pain to stressful life events or to dental work. These women reported that their experience of pain had been transformed by shamanic healing because they felt less hopeless about the pain; they perceived that the SP had given them ways to cope with their pain, or both. Women in this category also reported feeling more at ease, balanced, and in control of their lives.

*Reduced TMD pain, but inconsistent or missing reports on psychosocial changes:* Two women were in this category. One reported improved TMD pain at all four follow-up interviews; however she reported only positive changes, such as feeling “calm and centered,” at the first two follow-up assessments. The other woman reported less pain but did not discuss other aspects of her psychosocial well-being.

*TMD very painful since ending treatment, but consistent positive changes in psychosocial well-being:* The one woman in this category reported considerable life stressors, including moving through various homeless shelters. Nevertheless, she consistently reported positive psychosocial changes in her life and believed that she had benefited a great deal from shamanic healing.

*Increasing TMD pain and minimal positive changes in psychosocial well-being:* Two women reported minimal or short-term treatment effects during follow-up. One woman reported that shamanic treatment had been valuable but felt that the effects “wore off” shortly after treatment ended. The other participant reported that during treatment she felt it was powerful; however, so much had happened in her life that she had difficulty determining if anything else had changed as a result of treatment.

### Additional Shamanic Treatment

All participants were asked if they had initiated shamanic treatment after completion of the five visits and if they had learned to journey. Seven participants sought additional treatment from an SP. Five of these indicated they had learned to journey in those sessions. Another seven participants learned to journey on their own.

The statistical analysis compared the group who had received shamanic treatment ( $n = 7$ ) to the group who had learned to journey on their own ( $n = 7$ ), plus those who did nothing ( $n = 5$ ). There were no statistically significant differences in the means of pain scores between those who received additional healing and those who had learned to journey on their own or did nothing.

### Discussion

This research supports other studies suggesting that treatments that attend to the psychosocial needs of individuals with TMDs may have lasting effects.<sup>10,16</sup> For most of the participants in this study, the positive effects of treatment

appear to have lasted for at least 9 months after treatment ended. Moreover, the continued participation of those who entered treatment (19/23, or 83%) suggests that shamanic healing is feasible and acceptable to women with TMDs. This study differs from previous studies involving psychological or spiritual healing in that participants did not receive adjuvant physical treatment. The mechanism by which healing occurs without physical intervention has yet to be examined. It may involve reframing the patient's perception of the symptoms as a dysfunction so that they are viewed as a cue to physical and mental states that are within the individual's control.<sup>23</sup> This seems to be supported by comments in the interview data by participants who had a better quality of life despite some continued symptoms.

The results of this study should be considered in light of some limitations. First, we had no control group. Rather, since shamanic healing had never been evaluated in a clinical trial, we conducted a feasibility trial and integrated qualitative interviews into the study design to determine how participants define and assess healing. Reports and systematic reviews in the literature provide comparative information on outcomes of usual care, behavioral and CAM treatments, although these studies vary in terms of measures and protocols used.<sup>54,55</sup> Findings from the randomized control trial that provided the basis for this research offer a clearer look at outcomes of a usual-care care control group, though assessments ended at three months after treatment. Subjects in that study reported decreases in usual pain, worst pain, and functional impact, but these improvements did not approach the level of those obtained from shamanic treatment.<sup>56</sup>

Reviews of other mind-body interventions, such as CAM treatments, mindfulness meditation, and yoga, provide some suggestion of how shamanic healing would compare to these treatments. Outcomes of Traditional Chinese Medicine and Naturopathic Medicine reported by Ritenbaugh et al indicate that these therapies may also be efficacious in treating TMD, as do systematic reviews of CAM treatments.<sup>54,55,56</sup> Individual studies of mindfulness meditation<sup>57</sup> characterize it as a promising intervention for chronic pain, although a recent systematic review found insufficient evidence to determine the magnitude of effects or to distinguish between specific and nonspecific effects.<sup>58</sup>

A second limitation of our study is the small sample size, which permitted only limited examination of provider effects and precluded multivariate analyses. Third, all of our participants were women and Caucasian. However, these characteristics are consistent with TMD prevalence data,<sup>5,6</sup> and thus we do not believe this limits the applicability of these results to the affected population.

**The mechanism by which healing occurs without physical intervention ... may involve reframing the patient's perception of the symptoms so that they are viewed as a cue to physical and mental states that are within the individual's control.**

## Conclusion

This study of shamanic healing for women with TMDs is, to our knowledge, the first clinical trial of shamanic healing for TMDs. Despite the discussed limitations, the sustainability of substantial improvements, from end of treatment through nine months of follow-up, suggests that further research into this form of healing as treatment for TMD is warranted. ❖

## Disclosure Statement

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### The Path

The only question is: Does this path have a heart?  
If it does, then it is a good path. If it doesn't, then it is of no use.

— Carlos Castañeda, 1925-1998, American anthropologist and author