Chapter 28

Evaluation of BodyTalk, a novel mind-body medicine, for chronic pain treatment

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Abstract

The objective of this study was to evaluate BodyTalk, a novel system of complementary and alternative medicine (CAM), for the treatment of chronic pain. The study investigated whether people with chronic pain conditions showed improvements in pain, emotional factors, and overall health measures following 8 weekly distance BodyTalk treatments using the on-line Patient Reported Outcomes Measurement Information System (PROMIS). The study evaluated 36 subjects, randomized into a treatment (N=19) and a control group (N=17) using a single-blinded design in Phase I, followed by a crossover Phase II where the control subjects were treated. Subjects completed PROMIS assessments to self-report on their pain levels and other factors prior to, throughout the course of treatment, and 3 months post-treatment. The blinded treatment group showed significant improvements compared to the control group for pain level (p=0.0486), anxiety (p=0.034), and satisfaction with social role measures (p=0.035). Fatigue, overall physical and mental health showed significance in the pooled treatment group data. This initial evaluation of BodyTalk suggests that this mind-body CAM system is effective in reducing pain level as well as emotional symptoms associated with long-term chronic pain. A larger scale replication study with strong statistical power is warranted to validate and confirm these preliminary findings.

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Introduction

Chronic pain has now surpassed cancer, cardiovascular disease, and diabetes combined to emerge as the leading public health challenge, affecting approximately 100M adults in the United States (1). The annual cost is estimated at over $560B in treatment-associated expenses and lost productivity (1). It is now recognized as a distinct and complex disease with associated neurological changes that create a heightened sensitivity to pain perception. Chronic pain is uniquely individual, subjective, and dependent on a variety of biological, psychological, and social factors (1). Pain sensitivity and duration can be influenced by genetic factors, illness, injury, inflammation, as well as the emotional state of the patient (1,2). Fear, anxiety and depression are prevalent in the chronic pain population and have a central role in pain duration (2).

Despite its prevalence, treatment of chronic pain is inadequate, with estimates of only 50% of the affected population having adequate pain control (1). Even when pain level is reduced, there is often no improvement in physical functioning or emotional symptoms (3). In 2011, the Institute of Medicine recommended that successful chronic pain treatment strategies address the whole patient; the symptoms, emotional state, belief systems, expectations, and responses of others to the patient's pain condition (1). Limitations of the conventional healthcare system to effectively treat this disease have motivated many chronic pain sufferers to explore complementary and alternative medicine (CAM) approaches (4).

Based on clinical experience and unpublished case studies, it is anticipated that the comprehensiveness and safety of a novel CAM system, BodyTalk, may be well-suited to address the individualized nature and complexity of chronic pain. The BodyTalk System (5) was developed in the early 1990s by Dr. John Veltheim, an acupuncturist and chiropractor, and is based on a dynamic-systems and quantum-physics model of an integrated body, mind and spirit. BodyTalk emphasizes identifying the underlying psychological and emotional aspects of a physical health issue (5). A BodyTalk practitioner works with a structured procedure of neuromuscular biofeedback to develop an individualized treatment plan using an integrative map of the body and mind, the BodyTalk protocol chart.

This protocol chart draws upon the anatomy and physiology of the body from a Western biomedical view together with the energetic anatomy of the acupuncture meridians, five elements and chakras from Chinese and Ayurvedic medicine (5). A treatment may include any combination of over 50 possible balancing techniques in the BodyTalk protocol charts that can address potential causative factors in a pain condition compromising the patient's innate ability to heal: elevated stress, scar tissue from injury or illness, impaired energy flow through the acupuncture meridians, emotional trauma and other factors.

Once the specific sequence of healing techniques is identified by the yes/no neuromuscular biofeedback in a BodyTalk treatment, the practitioner performs these techniques including a tapping procedure over the brain and heart.

This study is a pilot investigation of BodyTalk for treatment of chronic pain using a blinded, controlled study design. As BodyTalk treatments can either be done in person or by distance, subjects were blinded as to their group assignment by using practitioners working at

remote locations from the subjects. To evaluate BodyTalk efficacy, subjects reported on their pain level and other associated health and emotional factors throughout the treatment protocol using the quantitative and extensively validated PROMIS system of self-reporting instruments.

Methods

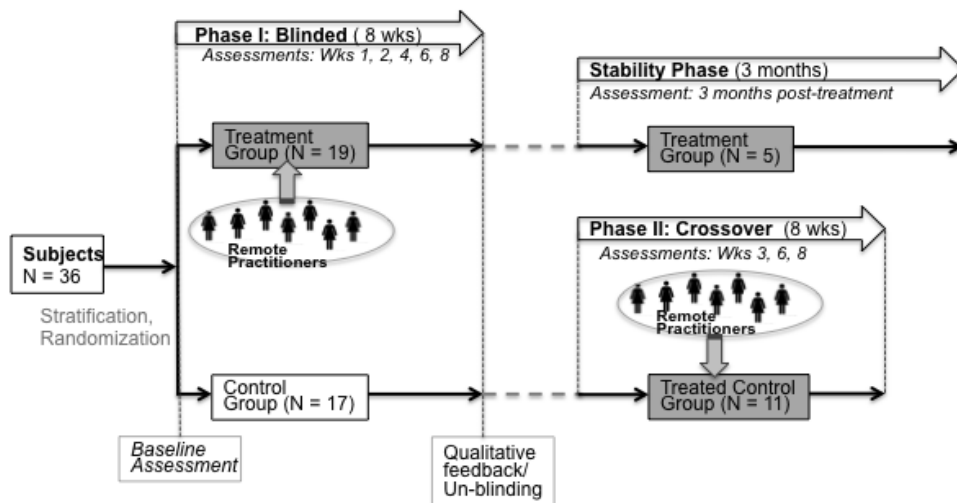The study design, diagrammed in figure 1, was IRB-approved by the National Foundation for Energy Healing.

Figure 1. Flow Chart of Study Design.

Participants

Individuals with chronic pain conditions were recruited using flyers and newsletter announcements. Selection criteria included: 1) self-reported daily pain level of level 4 or greater (range 0-10) for a duration of 6 months or more; 2) willingness to avoid use of other CAM treatments during the study; 3) no previous BodyTalk treatment; and 4) age 18 years or over. Prospective participants taking opiate-based pain medications were excluded but all other medications were allowed. Participants were consented and submitted a health history form and photo. The participants were stratified by duration of pain (< or ≥ 5 years), and medication use (none, over the counter only, or prescription). Within each stratum, they were randomly assigned to treatment or control groups using a block randomization design with block sizes from 4-8.

Treatment protocol

Seven certified BodyTalk practitioners who had excellent success rates working in a distance format, performed remote treatments on the participants. Treatments were done according to standard BodyTalk clinical practice except there was no practitioner-subject interaction at any time during or after treatment in Phase I of the study in order to maintain the blinded status of participants. During the remote treatments, the practitioners used neuromuscular biofeedback to generate yes/no responses allowing determination of the specific techniques and the order in which they needed to be performed.

The treatment technique options were chosen from the BodyTalk Protocol chart which includes the following types of treatment techniques: in Section 1, any area of the body can be balanced (for example, an organ, an endocrine gland, a part of the brain, an acupuncture meridian or a chakra); in Section 2, external stressors are identified and cleared (such as specific people in the individual's life, professional or financial issues) along with the areas of the body they are impacting; in Section 3, belief systems or social factors that are creating stress are identified and balanced; and Section 4 techniques address imbalances of the immune system, circulation, musculoskeletal alignment, and emotions held from previous traumas. The identified techniques were then performed by the remote practitioner with visualization of the subject.

In the blinded Phase I, the control group received no BodyTalk treatments or other interventions, while the treatment group received 8 weekly BodyTalk treatments. All participants were instructed to rest quietly (sleep, read, meditate, watch or listen to something) during their appointment time and were informed that they had a 50:50 chance of receiving a distance BodyTalk treatment or of receiving no treatment. Treated individuals received treatments from at least 2 practitioners in order to minimize practitioner bias. Participants were then un-blinded, and in the crossover Phase II, the controls received 8 weekly treatments from the same practitioners, except that treatments now included phone or skype meetings between the practitioners and participants during or after the treatment to discuss the focus of the treatment.

Outcome assessments

Treatment-associated changes were evaluated using a 59 question on-line survey comprised of the PROMIS Instruments: PROMIS 43 Profile v1.0, PROMIS v1.0 ED–Anger short form 1, PROMIS v1.0–Global (6, 7). The specific questions can be viewed at the PROMIS website (7).

The quantitative surveys rated pain level on a 0-10 scale and impact, emotional factors, fatigue, sleep quality, and satisfaction with social role on a scale of 1-5. Qualitative data were collected on medication changes and adverse events using investigator-developed instruments.

On-line assessments were collected at baseline (3 replicate surveys to check reliability), and a single survey was collected a few days post-treatment after each of the following treatments: week 1, 2, 3, 4, 6 and 8 during Phase I, on week 3, 6 and 8 in Phase II and 3 months following the final treatment for the Stability Phase. Prior to informing participants of their group assignment at the end of Phase I, they were asked to guess their group assignment,

including a description of the reasons for their opinion, and to report any benefits or issues that were not covered by the PROMIS survey.

Analysis

Statistical analyses were performed to evaluate and test the efficacy and impact of treatment on chronic pain using t-test and one-way analysis of variance (ANOVA). Chi-square was used to compare demographic data between groups. Fisher's exact test was used when one or more cells had an expected frequency of five or less. Statistical significance was defined as $p<0.05$ and all tests were two-sided. Treatment impacts were evaluated by comparison between the mean baseline scores and the mean post-treatment scores after sessions 6 and 8. In an effort to better understand the impact of the treatment on chronic pain and provide insight into the nature of the relationship, a local regression fitting method, Loess [8-10], was used. Loess uses segmented low-order polynomials to fit the data, does not make any a priori assumptions about the nature of the influence being examined and is particularly flexible in identifying influences that take a variety of functional forms.

Results

Fifty recruited participants met selection criteria, and 36 were included in the final analysis. Participant data were included if at least one baseline survey and one survey after treatment 6 were submitted. The survey completion rate ranged from 2-6 post-treatment surveys (Mean = 5 for the control and 4.74 for the treatment group). The demographics are summarized in table I. The treatment and control groups were well balanced for the range of pain conditions, age ($p=0.74$) and medication use ($p=0.96$). The gender breakdown included 17 women per group, and an additional 2 men in the treatment group ($p = 0.49$).

   The participants were initially stratified and balanced for pain duration ($<$ or $\geq$ 5 years), however, in the final analysis, the mean pain duration in years was longer in the treatment group (13.8 years vs. 6.6 in control; $p = 0.044$).

   The combined drop out and exclusion rate was 14/50 (28%): 9 for insufficient or lack of any PROMIS reporting and 5 due to participant request because of time conflicts. The demographics of the excluded participants were compared to the two experimental groups, indicating a gender difference with 9/11 recruited males excluded from analysis but no other significant differences.

Pain level improvement

Pain Level (as measured by PROMIS global pain measure, Global07) was the variable of primary interest in this study. Figure 2A illustrates that 73.7% (14/19 subjects) of the treatment group and 31.6% of the control group (5/17 subjects) reported improvement in their pain level by the end of Phase 1. Improvement was defined as a mean change of at least 1

level (12.5%) on a 0-10 pain rating scale between baseline and post-treatment. Two additional treated participants reported pain level improvement in their qualitative feedback.

Almost half of the treated group (47.7%) reported moderate to strong pain reduction (6 subjects with 30-60% pain reduction; 3 subjects with > 60% reduction). This compares with only 2 controls (11.7%) reporting pain reduction at the level of 30% or more. The time to improvement was variable. Some participants reported improvement at the beginning of the treatment series and others showed improvement only after the final treatment.

Table 1. Demographics

	Control Group (N = 17)	Treatment Group (N = 19)	*p*-value
Age (years)			
Mean (range)	53.2 (39 – 70)	52.1 (30 – 67)	0.72
Gender			
Male	0	2 (10.5%)	0.49
Female	17 (100%)	17 (89.5%)	
Pain Duration (years)			
< 5 years	7 (41.2%)	7 (36.8%)	0.79
≥ 5 years	10 (58.8%)	12 (63.2%)	
Mean (range)	6.57 (0.67 – 15)	13.77 (0.65 – 50)	0.04
Baseline Pain Intensity (0-10)			
Mean (range)	6.0 (3.9 – 8.1)	6.7 (5 – 8)	0.19
Mean Min	3.8	5	
Mean Max	8.1	8	
Medications			0.96
None	8 (47.1%)	8 (42.1%)	
Over the counter	5 (29.4%)	6 (31.6%)	
Prescription	4 (23.5%)	5 (26.3%)	
Pain Types			
Arthritis, RA	3	3	
Back/Neck	8	8	
Joint/Musculoskeletal	9	7	
Fibromyalgia	2	2	
Thoracic outlet	1	1	
Other *	3	2	

* Multiple Sclerosis, Reflex Sympathetic Dystrophy, Inflammatory Bowel Disorder, congenital, migraine.

Pain Level Results (Global07)

<u>In the past 7 days:</u>

How would you rate your pain level on average?

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
0   1   2   3   4   5   6   7   8   9   10
No pain   Worst imaginable pain

Percent with improvements in pain level

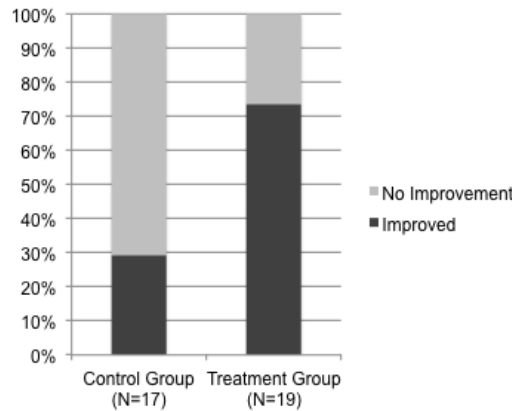Figure 2A. Pain level improvement in treatment and control groups.

Significant improvements overall

Table 2 summarizes all the PROMIS evaluation areas (domains) that showed significance. The change in scores from the mean of baseline to the end of treatment values is shown for Phase I control and treatment groups and for the pooled treatment groups in both phases. Significant improvements were observed in 7/10 domain areas evaluated, for either the combined domain score level or for one or more individual questions in the domain.

The most significant improvements were observed in domains with combined significance (over all 6 PROMIS questions in the domain) or standardly measured with a single question: pain level ($p=0.048$), anxiety (combined $p=0.034$) satisfaction with social roles (combined $p=0.035$) and fatigue (combined $p=0.04$ in pooled treatment data), as highlighted in yellow in table 2 and graphically depicted in the boxplot comparison in Figure 2B.

Considering the small sample size, two additional domains showed trends that did not reach significance for the combined score pain impact and depression domains, with an individual question in each area showing significance: pain impact (for interference with work around the home, $p=0.014$), and depression (feeling worthless, $p=0.027$), as highlighted in gray in table 2. As expected, the analysis of higher numbers in the pooled treatment groups was more sensitive at detecting improvements (30 pooled versus 19 in Phase I alone).

Table 2. Evaluation of improvement in Phase I and II

| Domain | Question (PROMIS ID) | Phase I | | | | | | Phase I + Phase II (pooled) (crossover) | | | |
| | | Control Group (N=17) | | Treatment Group (N=19) | | | | Both Treatment Groups (N=30) | | | |
		Mean	SD	Mean	SD	*p*-value	Effect Size	Mean	SD	*p*-value	Effect Size
Pain Intensity[e]	**Global07**	-0.33	1.77	-1.53	1.73	0.0486 [a]	1.20	-1.77	1.90	0.0146 [a]	1.44
Anxiety [e]	EDANX01	0.12	0.77	-0.62	0.74	0.0060 [a]	0.74	-0.51	0.69	0.0064 [a]	0.63
	EDANX40	-0.12	1.01	-0.32	0.97	0.5400	0.20	-0.52	0.95	0.1700	0.40
	EDANX41	-0.24	0.81	-0.81	1.15	0.0920	0.57	-0.70	1.03	0.1100	0.46
	EDANX53	-0.17	0.71	-0.68	0.98	0.0840	0.51	-0.57	1.04	0.1600	0.40
	EDANX46	0.11	0.73	-0.50	0.93	0.0390 [a]	0.61	-0.55	0.81	0.0087 [a]	0.66
	EDANX07	0.01	0.82	-0.30	0.87	0.2900	0.31	-0.38	0.85	0.1300	0.39
	Combined Score ANXIETY	**-0.28**	**3.93**	**-3.26**	**4.14**	**0.0340** [a]	2.98	**-3.24**	**3.91**	**0.0170** [a]	2.96
Fatigue [e]	HI7	-0.44	1.21	-0.51	0.65	0.8358	0.07	-0.70	0.92	0.4100	0.26
	AN3	0.09	1.15	-0.74	0.86	0.0190 [a]	0.83	-0.62	0.92	0.0240 [a]	0.71
	FATEXP41	0.04	1.28	-0.58	0.92	0.1000	0.62	-0.62	1.14	0.0730	0.66
	FATEXP40	-0.20	1.07	-0.56	0.74	0.2400	0.36	-0.67	0.85	0.1000	0.47
	FATEXP35	-0.18	1.08	-0.74	0.84	0.0900	0.56	-0.75	1.05	0.0830	0.57
	FATIMP49	0.07	0.98	-0.69	0.96	0.0240 [a]	0.76	-0.60	1.02	0.0300 [a]	0.67
	Combined Score FATIGUE	**-0.43**	**6.29**	**-3.92**	**4.16**	**0.0550** [a]	3.49	**-4.07**	**5.31**	**0.0400*** [a]	3.64
Satisfaction with Social Role[d]	SRPSAT07	-0.10	0.86	0.54	1.17	0.0690 [a]	0.64	0.53	1.02	0.0360 [a]	0.63
	SRPSAT24	-0.27	0.63	0.77	1.25	0.0034 [a]	1.04	0.54	1.10	0.0024 [a]	0.81
	SRPSAT47	0.00	0.99	0.55	1.15	0.1300	0.55	0.55	1.07	0.0890	0.55
	SRPSAT49	0.12	0.81	0.71	1.18	0.0920	0.59	0.70	1.10	0.0640	0.58
	SRPSAT50	0.00	0.79	0.44	0.91	0.1300	0.44	0.40	0.93	0.1400	0.40
	SRPSAT39	-0.24	0.91	0.52	1.02	0.0026 [a]	0.76	0.42	1.09	0.0430 [a]	0.66
	Combined Score SAT.	**-0.24**	**3.97**	**3.27**	**5.42**	**0.0350** [a]	3.51	**2.76**	**5.12**	**0.0430** [a]	3.00
Pain Impact[e]	PAININ9	-0.10	1.17	-0.69	0.86	0.0920	0.59	-0.70	1.00	0.0700	0.60
	PAININ22 [b]	0.03	1.17	-0.50	0.93	0.0140 [a]	0.53	-0.67	1.10	0.0440 [a]	0.70
	PAININ31	-0.06	1.26	-0.48	1.12	0.3000	0.42	-0.51	1.13	0.2200	0.45
	PAININ34	-0.13	0.88	-0.52	0.91	0.2000	0.39	-0.67	1.04	0.0760	0.54
	PAININ12	-0.30	1.09	-0.58	0.94	0.4100	0.28	-0.59	1.29	0.4300	0.29
	PAININ36	-0.26	0.91	-0.49	1.09	0.5000	0.23	-0.51	1.09	0.4400	0.25

Domain	Question (PROMIS ID)	Control Group (N=17)		Treatment Group (N=19)				Both Treatment Groups (N=30)			
		Phase I						**Phase I + Phase II (pooled) (crossover)**			
		Mean	SD	Mean	SD	*p*-value	Effect Size	Mean	SD	*p*-value	Effect Size
	Combined Score PAININ	**-0.58**	**6.08**	**-3.29**	**5.26**	**0.1600**	2.71	**-3.73**	**6.22**	**0.1000**	3.15
Depression[e]	EDDEP04 [c]	0.22	0.64	-0.41	0.94	0.0270 [a]	0.63	-0.32	0.78	0.0200 [a]	0.54
	EDDEP06	-0.01	0.76	-0.58	1.18	0.1000	0.57	-0.45	1.03	0.1300	0.44
	EDDEP29	-0.13	0.97	-0.37	1.01	0.4600	0.24	-0.54	0.95	0.1700	0.41
	EDDEP41	-0.11	0.69	-0.25	0.98	0.6100	0.14	-0.23	0.87	0.6200	0.12
	EDDEP22	-0.13	1.14	-0.37	0.96	0.4900	0.24	-0.33	0.87	0.1600	0.20
	EDDEP36	-0.22	0.98	-0.42	0.71	0.4800	0.20	-0.51	0.76	0.2600	0.29
	Combined Score DEPRESSION	**-0.18**	**4.49**	**-2.44**	**4.90**	**0.1600**	2.26	**-2.43**	**4.31**	**0.1000**	2.25
Global Health Indicators[d]	Global01 (General Health)	0.15	0.71	0.32	0.41	0.3963	0.17	0.44	0.53	0.1146	0.29
	Global02 (Quality of Life)	0.19	0.55	0.45	0.53	0.1528	0.26	0.42	0.56	0.1733	0.23
	Global03 (Physical Health)	0.05	0.52	0.41	0.63	0.0699	0.36	0.41	0.59	0.0437 [a]	0.36
	Global04 (Mental Health)	0.19	0.73	0.55	0.60	0.1155	0.36	0.64	0.61	0.0277 [a]	0.45
	Global05 (Social Satisfaction)	0.10	0.64	0.33	1.15	0.4475	0.23	0.34	0.98	0.3736	0.24
	Global06 (Physical Activities)	-0.12	0.86	0.26	0.76	0.1717	0.38	0.23	0.79	0.1686	0.35
	Global08 (Fatigue)	-0.20	1.09	-0.59	0.71	0.2044	0.39	-0.63	0.83	0.1305	0.43
	Global09 (Social Responsibility)	0.20	0.74	0.41	0.91	0.4428	0.21	0.44	0.85	0.3376	0.24

[a] *p*<0.05. Measures that showed combined score significance across the domain are highlighted in yellow and those that showed single question significance are highlighted in gray.

[b] PAININ22, the significant question in the Pain Impact domain evaluates interference of pain on work around the home.

[c] EDDEP04, the significant question in the Depression domain evaluates feelings of being worthless.

[d] Increased score indicates improved health status.

[e] Decreased score indicates improved health status.
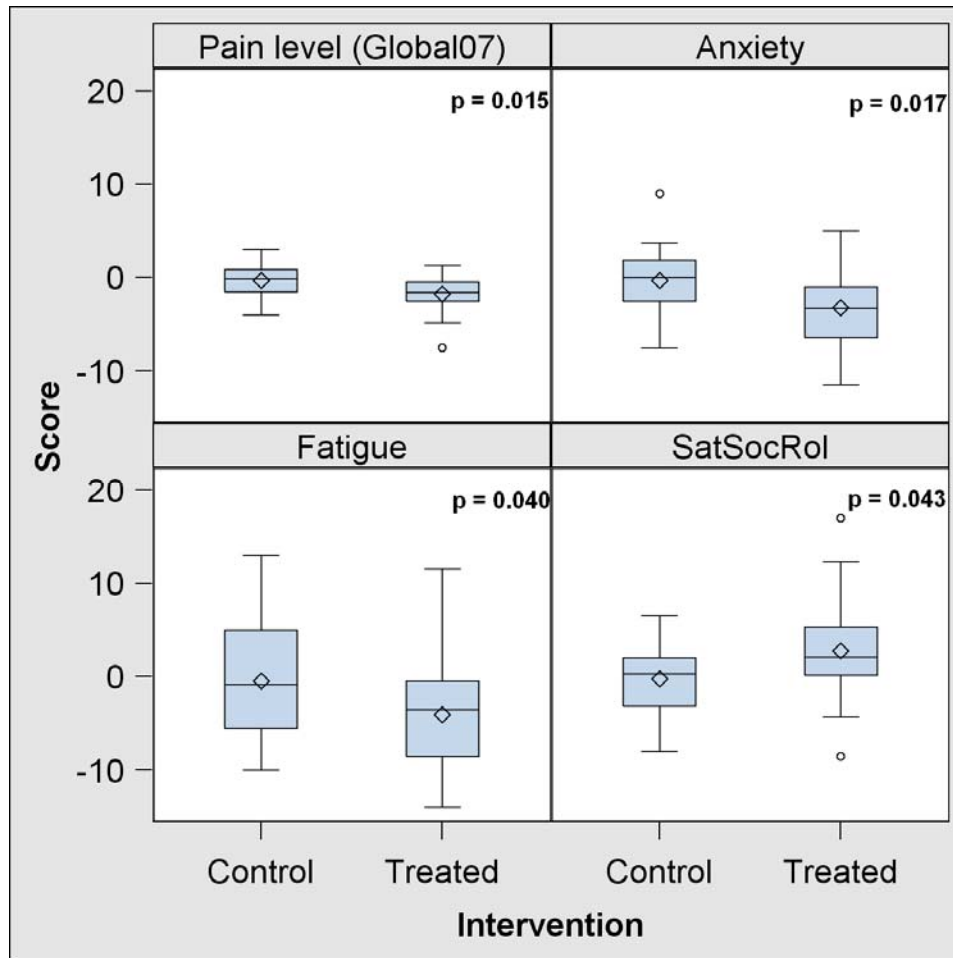
Figure 2B. Boxplot comparison of significant improvements.

For example, in the pooled data, pain level is significant (*p*=0.0146) while in the non-pooled data pain level is borderline significant (*p*=0.048), and two individual global health measures emerged as significant, physical health overall, (Global03, *p*=0.0437), and mental health, mood and ability to think (Global04, *p*=0.0277). Of note, over all 59 questions, the treatment group either improved or showed no change and in no case showed worsening

Loess Curves illustrate the longitudinal trends of significant changes for all participants in figure 3A (domains with combined score significance) and 3B (individual question significance). Figure 3A indicates the decline in anxiety and fatigue and increase in overall satisfaction with their social roles that was observed with treatment.

The individual question comparison depicts the decrease in pain, pain impact, anxiety, depression, and fatigue in the treatment group. In contrast, the five questions whose scores increase with improved health, global health measures (physical and mental health) and satisfaction with social roles, show upward trends in the treated vs control graphs.
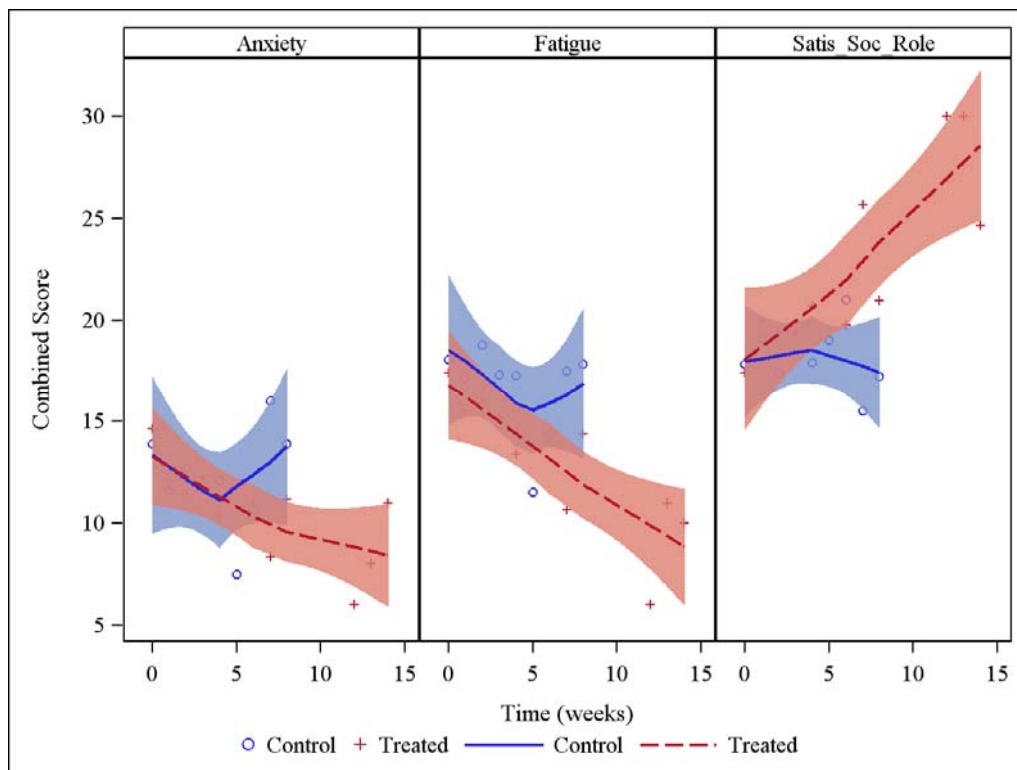
Loess Curves of Combined score Anxiety, Fatigue and Satisfaction with Social Role from PROMIS43 Profile v1.0. [7] for domains with statistical significance (*p*-value < 0.05) over the course of both treatment (Phase I and II) and stability phases. Fitted values for Loess locally linear fit with point 95% confidence intervals. Control Group: Blue Lines and Curves. Treated Group: Red Lines and Curves.

Figure 3A. Loess Curves fitting of combined score changes over time.

Qualitative feedback and stability

In the qualitative feedback on group assignment, 6 out of 14 treated individuals that responded (42.9%) believed they were in the treatment group, and 5 of these reported physical or emotional sensations, such as heat or pain relief, during their treatment times. In comparison, 8 of the 9 responding control participants felt they were in the control group (66.7%) or were unsure (22.2%), and only one individual (11.1%) in this group felt she was in the treatment group.

There was no discernable difference in prevalence or adverse symptoms between the two groups and no serious adverse reactions were reported. Forty one percent of controls and 37% of treated participants reported at least one adverse symptom, such as worsening of pain for a short time, flus, colds, or mild headaches at some point over the course of the study.

Of the 14 participants showing pain level improvement with treatment in Phase I, 5 responded to the stability phase survey. While the results are preliminary due to the small sample size, 4 out of 5 of those reporting showed stable or further improvement three months post-treatment.
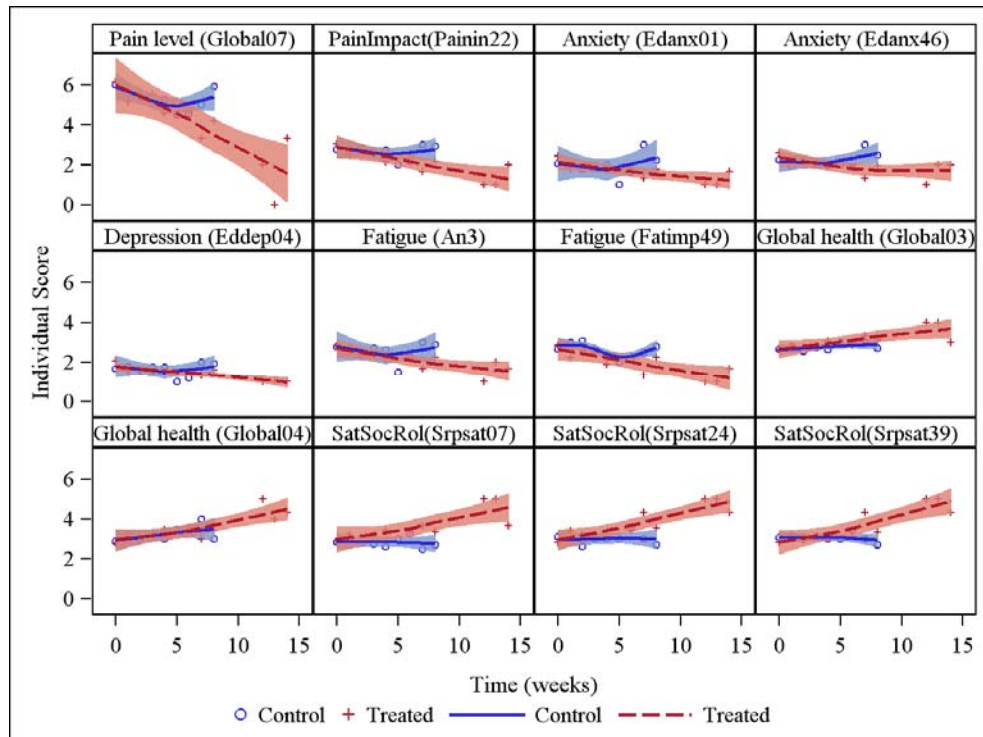
Loess Curves of Individual Questions in the listed domains from PROMIS43 Profile v1.0. [7] for all individual questions with statistical significance (*p*-value < 0.05) over the course of both treatment (Phase I and II) and stability phases. Fitted values for Loess locally linear fit with point 95% confidence intervals.

Figure 3B. Loess Curves fitting of individual question scores over time.

Discussion

The goal of this study was to evaluate BodyTalk for its efficacy in treating chronic pain using the self-reporting outcome instruments developed by the PROMIS Initiative. These instruments are rigorously validated and assess patient-reported health status for physical, mental and social well-being. The results of this study indicate that a series of distance BodyTalk treatments demonstrate significant improvements in pain level and associated symptoms in a cohort with long-term pain conditions, for an average of 13 years. In addition to improvements in pain, treated participants showed a decline in the typical set of symptoms generally found to be associated with persistent pain conditions: anxiety, depression and fatigue and showed an increase in overall life satisfaction, physical and mental health. The diversity of improvement suggests that BodyTalk works in an integrative way to relieve both physical and emotional symptoms in individuals with chronic pain. The pattern of improvements observed here match the holistic spectrum of health benefits documented in BodyTalk case studies where physical health improves as well as mood, energy and overall life outlook (5).

While there are no previous published clinical research studies evaluating the BodyTalk System, other CAM modalities that improve circulation, energy flow or address the emotional aspects of pain have shown efficacy in chronic pain as reported by others (4). CAM approaches to pain such as acupuncture (11), chiropractic (12), massage (13), hypnosis (14), mindfulness and biofeedback (15) have a similar underlying therapeutic basis as BodyTalk, and have accumulated evidence of reducing pain severity, physician visits, medication use, sick days, or emotional and psychological aspects of the disease (15). The results of this study strengthen the evidence that a holistic CAM therapy can be effective in chronic pain treatment.

How might BodyTalk work in chronic pain

The BodyTalk System can provide pain reduction with a quick-acting technique, "fast aid", which promotes relaxation, shifts the nervous system into a parasympathetic state and then engages the brain's focus on the area of pain. The second BodyTalk approach for pain is use of the complete BodyTalk protocol to determine the specific causative factors behind the condition. Causative factors may appear unrelated to the patient's pain condition. For example, in some study participants, the BodyTalk treatments identified viruses, bacteria and toxins using the "Body Chemistry" technique (5), and participants reported significant pain reduction shortly after treatment.

BodyTalk is also effective for promoting mental health, a key aspect of chronic pain. Approximately one third of chronic pain suffers have associated anxiety disorders and there is a higher co-morbidity of depression (2). To address emotionally-based symptoms, BodyTalk uses a specific technique, active memory (5,16), to facilitate clearing of anxiety, fear, grief and other emotions from the patient's past. This approach is similar to other emotional release techniques, such as EMDR (Eye Movement Desensitization and Reprocessing) that have shown good results in pain syndromes (17). Eye movements combined with event visualization are used in both techniques, and so the mechanism of action of active memory may be comparable to EMDR and REM sleep eye movements (18), facilitating disassociation of emotions, sensations, and belief systems about an event. The clearing of emotional associations with an injury or pain history may play a role in the health improvements observed in this study.

Other BodyTalk techniques have the potential to address biologically-based aspects of a persistent pain condition, such as impaired nerve communication, blood circulation, lymph drainage, acupuncture meridian flow or structural misalignment. For example, the BodyTalk "reciprocals" technique (5, 19) resets alignment in the joints, spine and cranium. The BodyTalk system incorporates approaches to balance the social aspects of health, such as lowering stress related to work or interpersonal relationships that may be challenged by a pain condition, suggesting an explanation for the satisfaction with social role improvement observed here.

Finally, how might it be possible for a practitioner to facilitate improvement of a pain condition, when working hundreds of miles away from a patient? Mechanisms of non-local healing or the action of the mind at a distance, as described by Dossey (20), are consistent with the quantum theory of entanglement of particles at a distance. There is precedent for distance healing impacts by other investigators who have shown benefit of distant prayer or

healing (21) in cardiovascular disease (22), AIDS (23), pain and inflammation (24). This study provides further evidence for distance healing, as the remote treatments here demonstrated health benefits to both the blinded and crossover treatment participants.

Limitations and future directions

While promising results were obtained in this preliminary evaluation of BodyTalk for treating chronic pain, it is recommended that future studies expand the sample size and follow-up duration, work with a more tightly-defined pain phenotype, and utilize objective measurements of efficacy. The smaller sample size, relatively short duration of follow-up, and group imbalances limited consideration of the time-course of treatment response, the stability of improvements, and gender or race-specific differences in BodyTalk effectiveness. With the higher dropout rate for males, the study focused on a predominantly female sample. Since gender-related influences in pain perception have been noted (25), follow-up studies should balance this key factor.

While the treatment and control groups were balanced for pain duration, there is a bias for longer pain duration in the treatment group in the sub-sample included for data analysis. As the longer duration pain conditions were in the treated population, the participants here may have had more serious underlying neurological or emotional conditions, been more intractable to treatment, potentially underestimating the BodyTalk treatment effect.

The results of this study suggest a longer-term treatment design for follow-up investigations. A maximal treatment response was not observed as several participants showed improvement only at the end of the treatment protocol. The suggestion of stability should also be confirmed. And, while there was no comparison of the efficacy of in-person and distance treatments, this is an excellent area for future investigation.

The comprehensive and personalized nature of BodyTalk's holistic approach suggests that this novel CAM has the potential to fill gaps in other treatment strategies for chronic pain. This investigation of BodyTalk provides promising preliminary results that this system of mind-body medicine is effective in reducing pain level, anxiety, overall social role satisfaction and fatigue associated with long-term chronic pain conditions. Larger scale follow-up studies are warranted to validate and confirm these findings for pain and other conditions that might be well addressed by BodyTalk.

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