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A Randomized, Controlled Trial of Wholistic Hybrid Derived From Eye Movement Desensitization and Reprocessing and Emotional Freedom Technique (WHEE) for Self-Treatment of Pain, Depression, and Anxiety in Chronic Pain Patients

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Abstract

In this pilot study, a convenience sample of 24 chronic pain patients (17 with chronic fatigue syndrome/fibromyalgia) were randomized into WHEE treatment and wait-list control groups for 6 weeks. Assessments of depression, anxiety, and pain were completed before, during, and at 1 and 3 months after treatment. Wait-listed patients then received an identical course of WHEE and assessments. WHEE decreased anxiety ($P < .5$) and depression ($P < .05$) compared with the control group. The wait-list-turned-WHEE assessments demonstrated decreased pain severity ($P < .05$) and depression ($P < .04$) but not pain interference or anxiety. WHEE appears a promising method for pain, anxiety, and depression in patients with chronic pain, compared to standard medical care alone. Though a small pilot study, the present results suggest that further research appears warranted. An incidental finding was that a majority of patients with chronic pain had suffered psychological trauma in childhood and/or adulthood.

Keywords

chronic pain, depression, anxiety, chronic fatigue syndrome, WHEE

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Chronic pain is a serious medical, social, and economic problem with enormous costs.[1] It is often challenging to help people with chronic pain achieve ongoing symptomatic relief, and even more so to find permanent healing from their chronic suffering.[2-4] Pain is an unpleasant physical sensation that can be tolerated better when anxieties and other associated psychological responses to the pain are addressed therapeutically.

Medications for pain reduce the intensity of the pain symptoms but do not address associated psychological issues that may be contributing to the pain by increasing pain intensity, decreasing tolerance for stress, or interfering with activity. Medications for pain have serious side effects, including drowsiness, clouded thinking, allergic reactions, habituation, addiction, and even fatalities.[5-7] Similar problems of debilitating side effects are encountered with medications for anxiety and depression.[8] And again, there are impairments in quality of life.

There are many integrative medicine therapies available to help people deal with their pain.[9] Some require administration by a therapist, as in acupuncture, massage, chiropractic, and eye movement desensitization and reprocessing (EMDR). Other integrative medicine therapies may be used as self-healing techniques, as in muscle relaxation, coping skills strategies, meditation, and energy psychology methods such as Emotional Freedom Techniques (EFT) and the Wholistic Hybrid derived from EMDR and EFT (WHEE).

EMDR involves the back and forth movement of one's eyes from side to side while focusing the mind on troublesome issues in one's life (eg, pain, stress, trauma).[10] An alternative procedure used by some practitioners is to alternately stimulate the right and left sides of the body with touch or sound. The alternating stimulation decreases the intensity of one's symptoms. Following symptom management, positive thoughts and

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feelings are introduced and strengthened with similar procedures. EFT focuses the mind on troublesome issues and counters these with a strong positive affirmation. This is done while tapping on a series of acupressure points.[11]

WHEE is a hybrid technique developed from EMDR and EFT. WHEE utilizes the alternating right and left stimulation of EMDR, combined with the focusing and positive affirmations of EFT. These are then followed by installation of positive thoughts and feelings as in EMDR, but also include the positive affirmations of EFT.[12,13]

Many studies support the efficacy of EMDR in treating posttraumatic stress disorder, anxiety, depression, pain, insomnia, and more.[14,15] Likewise, research shows that EFT decreases the intensity of symptoms such as pain,[16-18] depression,[17,19-21] anxiety,[17,19,22-25] posttrauma symptoms,[26] and posttraumatic stress disorder.[18,27-29] Research on WHEE has shown that it was equivalent to EFT and cognitive behavioral therapy in a pilot study exploring treatment of test anxiety in college students.[22] WHEE was again shown to be equivalent to cognitive behavioral therapy in a replication study of test anxiety in college students.[30]

WHEE was chosen as the integrative medicine approach for the present study because of its efficacy in reducing anxiety and depression and because it has been anecdotally reported to help people understand and reduce pain. Within an hour's session, people using WHEE often report significant decreases in their pain, and some report their pain is completely gone. WHEE is very simple to learn and use, yet it possesses rapid and substantive effectiveness. Clinical observations suggest that it can be highly effective, even when symptoms have been present for decades. WHEE is also reported to be helpful in reducing anxiety, stress, distress, and depression, factors that are known to contribute to developing and worsening pain, and to reduce one's ability to cope with pain.[12,31] Clinical observations suggest that the intensity of these issues, too, can be decreased very rapidly with WHEE.

In summary, favorable research and clinical evidence support the efficacy of EMDR and EFT—the 2 key components of WHEE. Randomized trials of WHEE in college students demonstrate effectiveness in reducing test anxiety and global distress. Clinical observations support the use of WHEE for pain, stress disorders, and depression. Based on this supportive evidence, the present study examines WHEE in people who suffer from chronic pain. This rigorous pilot study begins to fill an important gap in our knowledgebase regarding integrative medicine approaches to treating people with chronic pain. It was hypothesized that WHEE would prove effective in reducing pain, depression, and anxiety symptoms.

Methods

Participants

Patients (N = 24) were recruited in a convenience sample from a private clinical psychiatric practice in Toronto, Canada, between May 2010 and January 2013. To be eligible for participation, patients had to have had chronic pain for at least 1 year. A majority (81%) had suffered with pain for 5 or more years. Pain diagnoses were made by the referring family physicians. All suffered also from anxiety and/or depression and were seeking additional help to deal with these problems. All had been using medications for months or years, with only partial relief at best. Out of 21 patients with available information, 71% had suffered emotional traumas in childhood and 81% in adulthood. Institutional review board approval for the research was obtained prior to the start of the study. All patients provided informed consent prior to participating.

Design and Procedures

Participants were 12 pairs (24 participants), matched for sex and as closely as possible by clinical assessments for pain syndromes (see Table 1). They provided informed consent and were randomly assigned to either immediate WHEE lessons or a wait-list control group. Questionnaire assessments of pain, anxiety, and depression for both WHEE and wait-list patients were supervised by a research assistant prior to the first WHEE lesson, after weekly lessons 4 and 6, and follow-up assessments were completed at 1 and 3 months.

After the follow-up period, the wait-listed patients received their own series of 6 weekly WHEE lessons and completed assessments at the same intervals as they, as controls, and the first WHEE group had done. This offered the opportunity to investigate intra-individual changes resulting from WHEE with the same patients serving as their own controls. Throughout the study clinicians were not blinded to the intervention because WHEE lessons were provided by the first clinician, the developer of WHEE, and the patients discussed their progress with their psychiatrist, the second clinician. A research assistant was in charge of managing the assessment forms. The data analyst received the forms after completion of the study and was blinded to group assignments during all data analyses.

WHEE Intervention

The WHEE process is outlined in Figure 1, and detailed in a book and a manual.[11,12]

Participants were seen in person for the first WHEE lesson, followed by 5 phone or Skype (Internet-based, audio-visual communication) lessons. This was possible because WHEE is very simple to learn and use. Self-administered healing techniques that can be done at home are advantageous for chronic pain patients. This is because travel is often a serious undertaking due to the severity of chronic pain and pain interference in mobility. Some patients also lived on limited disability incomes and travel costs limited trips from home.

Assessments

Brief Pain Inventory (BPI). The BPI includes items that address components of sensory pain, including severity, location, chronicity, and degree of relief due to therapy.[32] The BPI also has items that address reactive pain components including depression, suffering, and perceived availability of relief.[33-36] Patients respond to 4 items that assess severity of pain and 7 items that assess functional interference resulting from pain. Both subscales are responded to on 0 to 10 Likert-type scales. The coefficient αs (ie, measures of internal reliability of the scale) for all 10 measurement occasions for pain severity and pain interference were $\alpha \geq .85$ and $\alpha \geq .92$, respectively.

Table 1. Participant Demographics.

ID	Age	Sex	Child Trauma	Adult Trauma	Diagnoses and Age (and Duration)
1A	53	Female	✓	✓	CFS/FM (2 years), osteoarthritis
1B	50	Female	✓	✓	Alcoholism, CFS/FM—9, improved—30 with yoga, worse (1 year)
2A	48	Female		✓	MVAs ×5 (1986-1987) with concussion, insomnia, chronic pains
2B	54	Female	✓		Chronic pain, post R ear infection (3 years) [Dropped out of study after serving as control for matched pair, having 2 WHEE sessions]
3A	60	Female		✓	CFS/FM (23 years); depression; migraines (recent)
3B	45	Female		✓	Obesity from childhood; sleep apnea; multiple injuries; CFS/FM (2 years)
4A	52	Male	✓	✓	MVA head injuries, chronic pain (3 years) [uncooperative, dropped from study after 2 sessions]
4B	52	Male	?	?	MVA/chronic pain (5 years) [uncooperative, dropped from study]
5A	54	Female	✓	✓	R knee injury—29, surgeries w/ chronic pain (5 years); Genl. Anx. DO
5B	29	Female	✓	✓	Wearing high heels → chronic pain (10 years); posthysterectomy emotional trauma; conflict with ex-partner (father of her children); depression; Genl. Anx. DO; MVA → FM (10 years)
6A	60	Female	✓		MVAs ×2; FM (16 years), chronic pain; cancer
6B	62	Female	✓		FM (10 years), chronic pain; cancer; psychotic [unable to participate after serving as control]
7A	55	Female	✓	✓	CFS/FM (12 years); migraines, Lyme disease—49
7B	60	Female	✓	✓	CFS/FM (28 years); endometriosis, infertile; query Lyme disease
8A	40	Female		✓	MVA, FM (10 years), PTSD [uncooperative, dropped out]
8B	60	Female	?	?	CFS/FM (10 years) [uncooperative, dropped out]
9A	56	Male	✓		MVA, multiple fractures—17; migraine from childhood; FM (10 years)
9B	55	Male	✓	✓	Migraine, left hemicrania contina (4 years); sinusitis/L polyps removed; childhood PTSD; stressful occupation
10A	49	Female		✓	MVA ×3 2003-2004; CFS/FM (5 years); seizures several years, stopped 2010
10B	34	Female	✓	✓	MVA—29; pain neck and back; CFS/FM (4 years); seizures; family and cultural stresses; depressed; muddled thinking
11A	52	Female		✓	MVAs ×5 1993-1995, court trial; pneumonia; CFS/FM (13 years)
11B	27	Female	?	?	Snowboard accident—26 and MVA—27 → chronic pain, FM (1 year) [uncooperative, dropped from study after responding to only 3 questionnaires in control group]
12A	48	Male	✓	✓	MVA—2007—concussion, TBI, multiple injuries; confused, poor recall; CFS/FM (5 years)
12B	49	Male	✓	✓	CFS/FM (13 years); pains upper body, neck, limbs; poor sleep; obsessive personality; oppositional
			N = 15	N = 17	

Abbreviations: CFS, chronic fatigue syndrome; FM, fibromyalgia; EFT, Emotional Freedom Techniques; EMDR, eye movement desensitization and reprocessing; WHEE, Wholistic Hybrid derived from EMDR and EFT; MVA, motor vehicle accident; Genl. Anx. DO, general anxiety disorder; PTSD, posttraumatic stress disorder; TBI, traumatic brain injury.

Beck Depression Inventory—Second Edition (BDI-II). The BDI-II assesses the existence and severity of symptoms of depression as listed in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (1994).[37,38] Patients respond to 21 items on a 0 to 3 Likert-type response scale. The coefficient αs for all 10 measurement occasions were $\alpha \geq .57$.

Zung Anxiety Scale (ZAS). The ZAS was developed as a self-report instrument for people being evaluated for anxiety-associated symptoms.[39] Patients answer 20 questions related to the frequency of various symptoms on Likert-type scales of 0 (*none or a little of the time*) to 10 (*most or all of the time*). The coefficient αs for all 10 measurement occasions were $\alpha \geq .82$.

Statistical Analysis

Data were analyzed using linear mixed models in SPSS 19. Mixed models allow for greater flexibility than traditional repeated measures analysis of variance techniques and offer the advantage of utilizing all data present at each time point.[40-42] This was a key advantage in the present design due to some attrition across time points. The present models were estimated by specifying a first-order autoregressive covariance matrix and specifying time and condition (when appropriate) as fixed factors in the analysis. No other covariance models or random effects specifications enhanced model fit (ie, 2 log likelihood, Akaike information criterion, Bayesian information criterion). When significant effects were detected, follow-up comparisons were conducted using within participants pairwise comparisons with the first time point serving as the reference category to which all other time points were compared.

Attrition

Two pairs of WHEE and matched wait-list controls were dropped. Both participants in both pairs proved incapable of following the required protocols for filling out questionnaires and keeping appointments. A fifth participant, who had served as a wait-list control, dropped out after 3 lessons without explanation. A sixth wait-list participant was severely emotionally unstable and unable to provide her personal history or use WHEE appropriately, though she had served as a wait-list control for her matched pair. A seventh participant, in the wait-list group, proved incapable of following the protocol for questionnaires after having filled out the first two. Her paired immediate WHEE group participant completed the series of lessons but had not had a self-control period, so her data could not be analyzed

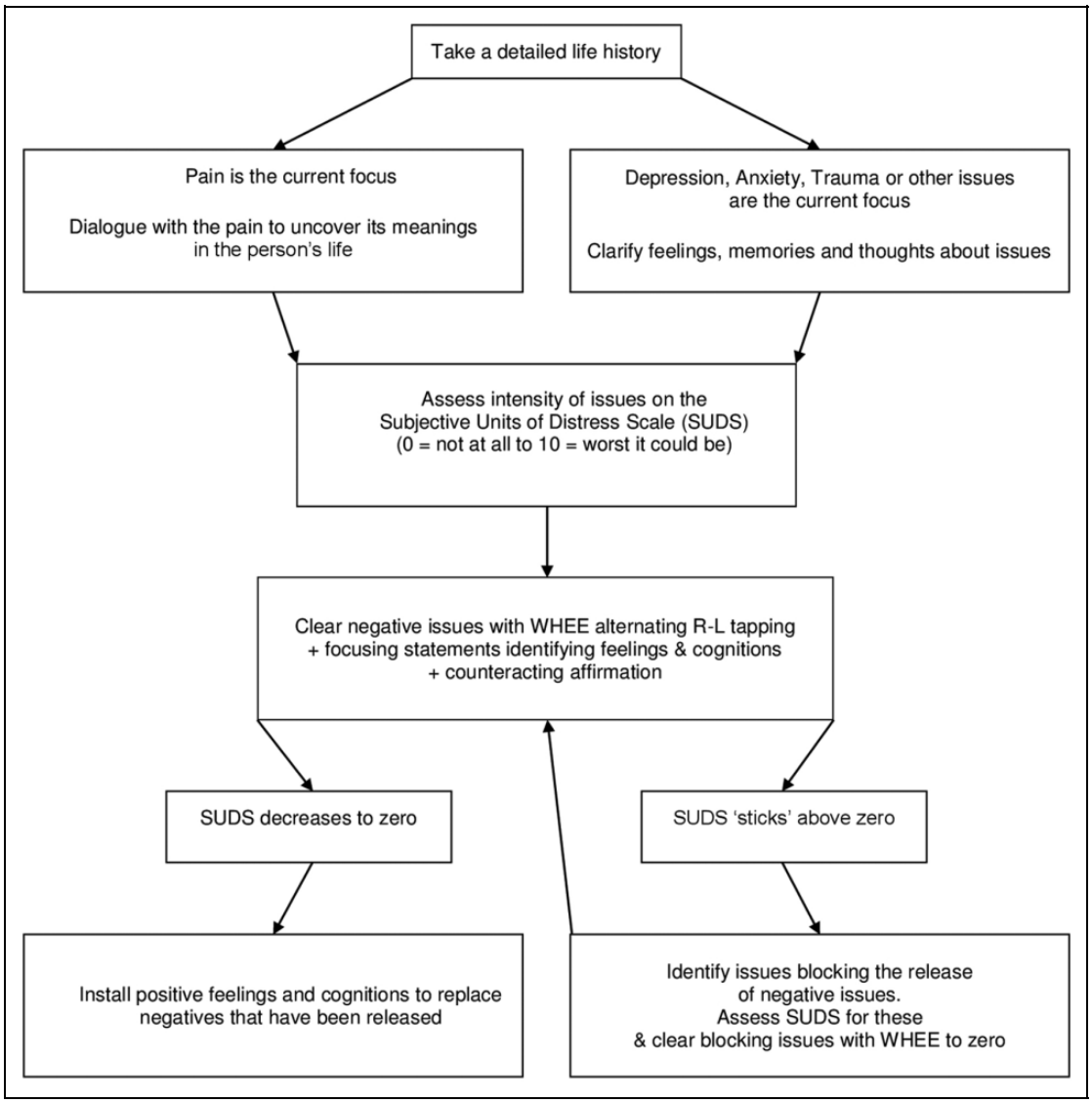

Figure 1. WHEE procedures.

other than as a self-report of her progress during the lessons. Flow of patients through the study is shown in the CONSORT chart in Figure 2.

Results

Figure 3 shows that the WHEE group experienced declining and consistently lower levels of anxiety over time while the wait-list group showed consistently higher levels of anxiety ($F[4, 63.32] = 2.72$, $P < .05$). This was also true for depression. The WHEE group showed declining and consistently lower levels of depression over time while the wait-group showed consistently higher levels of depression ($F[4, 61.17] = 3.82$, $P < .05$). Pairwise comparisons of time 1 anxiety and depression levels to all subsequent time points showed that WHEE participants had significantly lower levels of anxiety and depression at all time points as compared to time 1 (Ps < .05). Conversely, for wait-list participants anxiety ($P_{(\text{baseline vs week 4})} = .06$; $P_{(\text{baseline vs week 6})} = .30$; $P_{(\text{baseline vs 1-month})} = .05$; $P_{(\text{baseline vs 3-month})} = .50$) and depression ($P_{(\text{baseline vs week 4})} = .94$; $P_{(\text{baseline vs week 6})} = .56$; $P_{(\text{baseline vs 1-month})} = .92$; $P_{(\text{baseline vs 3-month})} = .25$) remained unchanged from time 1 at all subsequent time points.

In the second phase of the study, where the initial wait-list participants served as WHEE participants, evidence largely mirrored the results of the randomized phase of the trial (see Figure 4). Wait-list-turned-WHEE participants showed decreasing levels of anxiety over time but the change was not statistically significant ($F[4, 21.10] = 1.76$, $P = .18$). The decreases for depression were statistically significant ($F[4, 17.47] = 3.02$, $P < .05$) and every subsequent time point showed lower levels of depression as compared to depression levels at time 1 (Ps < .05). Decreases for pain severity were statistically significant ($F[4, 20.21] = 3.10$, $P < .05$) and pain severity remained decreased at weeks 4 and 6 (Ps < .05) but not

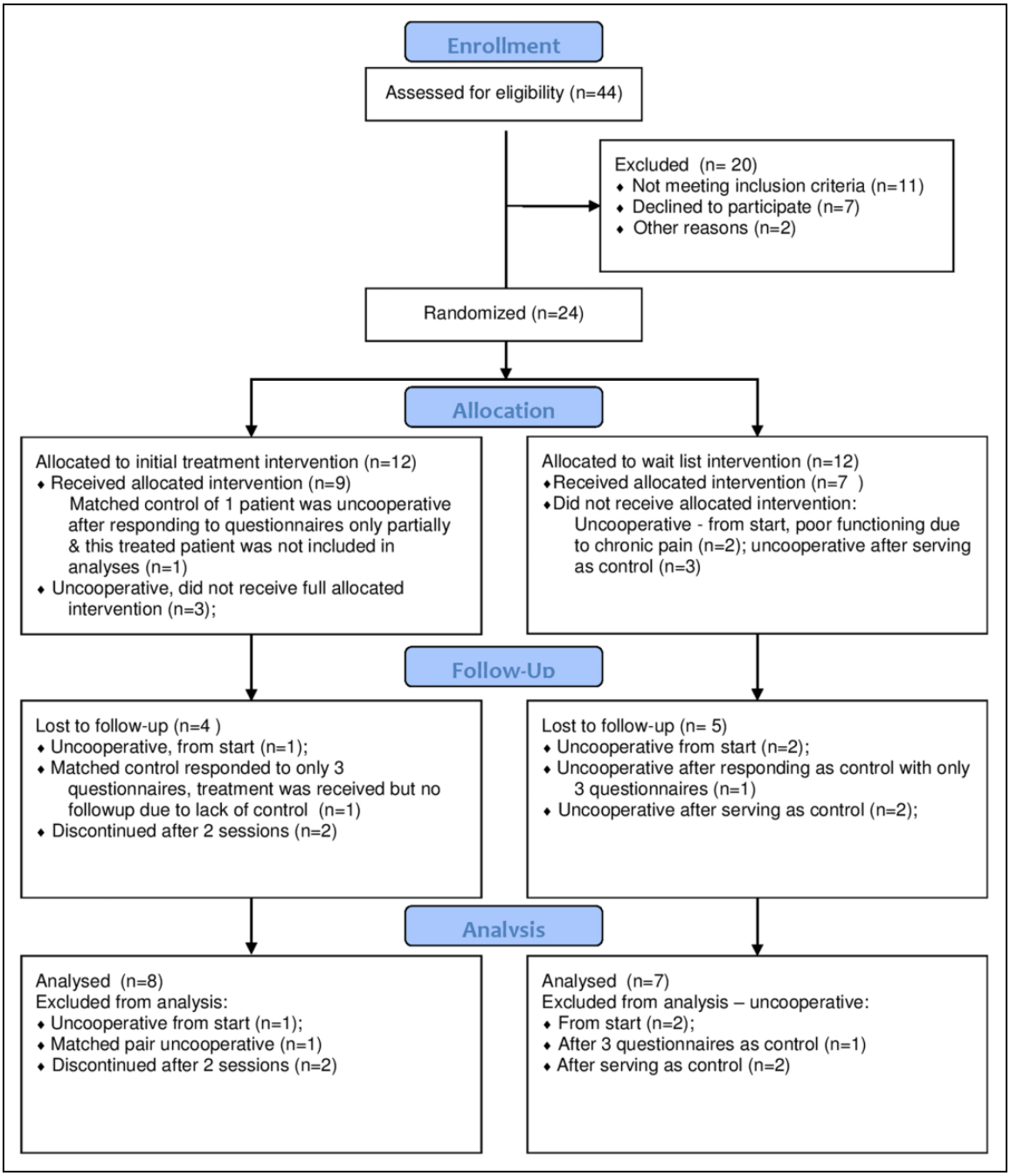

Figure 2. Flow of patients through the study.

at 1-month ($P = .25$) and 3-month follow-ups ($P = .24$). Decreases for pain interference just approached statistical significance ($F[4, 21.03] = 2.31$, $P = .09$).

Case Example

While statistical analyses provide a measure of assurance that the observed improvements were not likely to have occurred by chance, they do not convey a lot of the essence of clinical improvements that were observed with participants' uses of WHEE. This case example also provides a clearer picture of some of the procedural steps and processes involved in attaining these improvements.

"Bella" is a 48-year-old semiretired office administrator who had suffered 5 motor vehicle accidents between the ages of 26 and 27, including a concussion and repeated whiplash injuries. She had residual recurrent headaches and pains in her left knee; right neck; left shoulder, neck, and temporomandibular joint; and blurred vision in her right eye. Pains in her right hip and leg have been attributed to a herniated disc.

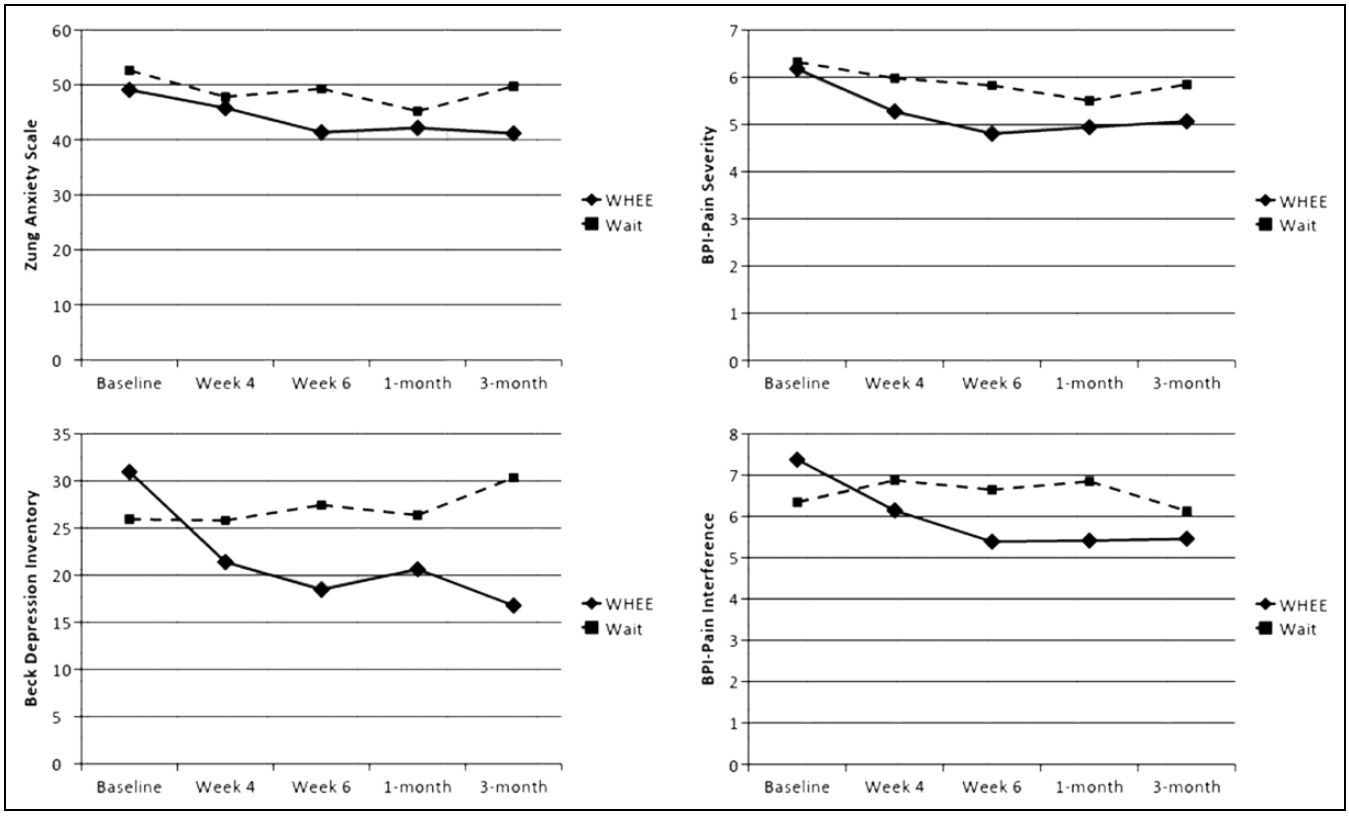

Figure 3. WHEE versus wait-list control assessments for anxiety, depression, and pain.

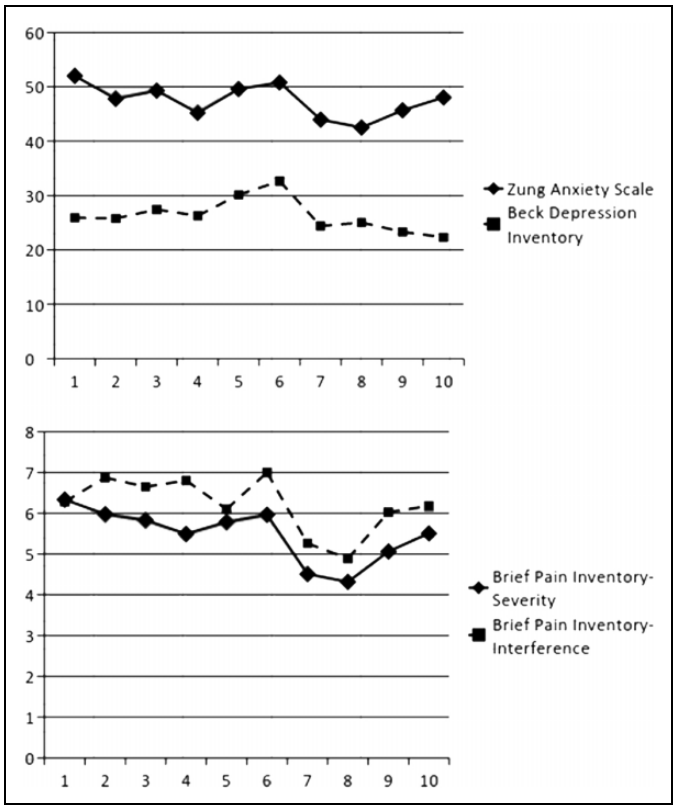

Figure 4. Wait-list control assessments for anxiety, depression, and pain during WHEE period versus wait-list control period.

Treatments had included Tylenol, Advil, and Motrin, plus self-medication with a history of heavy drinking for close to 10 years. The lighter pain medications brought minimal benefits so Bella was given Codeine for 18 years with limited benefits. Codeine was discontinued a year and a half prior to joining the WHEE study, producing withdrawal symptoms for 10 days (inability to eat and vomiting). She had been taking part of an Ativan nightly for sleep for 2 years prior to the study. Other treatments over the years with limited benefits included biofeedback, craniosacral therapy, gym workouts, and psychotherapy. Chiropractic in 1992 markedly worsened her pains. A support group for pain sufferers was of modest help. Bella was skeptical that anything else could be of substantial help but volunteered to participate in the study at the suggestion of her psychiatrist.

A detailed history elicited the report of having been punched at the age 25 in the left side of her face by the mother of the father of her son. Current stresses were high over the rapidly nearing marriage of her daughter, who was procrastinating over attending to preparations for the wedding.

Bella's severe agitation in the first session was addressed with WHEE tapping to demonstrate the potential for stress and pain release through self-healing that she could continue to use on her own. She was able to diminish her left shoulder and neck pains from an intensity level of 10 (the worst it could be) to 4, in one round of WHEE.

In her second session, Bella reported she had used WHEE since her first session on an occasional basis for her pains with

good results. At the time of this session she had a level 8 headache, which decreased in one round of tapping to 6. In response to dialogue with her pain she promised, "I can work on trying to forgive these people," with pain increasing to 8. (This is considered a good response, indicating she was connecting more solidly with the underlying emotional issues.)

Using WHEE on feelings of hatred, anger, hurt, disappointment, frustration, resentments, disgust over the violence she had suffered from the father of her children and his mother, Bella's pain decreased to 5.

When it remained 5 in the next round, she tapped on her collarbone acupressure releasing point, decreasing the pain to 4.

Tapping on "Boyfriend ruined my teen years, early 20s" decreased pain to a 3.

Tapping on "My daughter has suffered a lot too and I was too drunk to notice," pains increased to a 6.

Tapping on "Hatred, frustration, resentment, blame myself for staying in that relationship," pains decreased to a 5.

Tapping on "I'm not sure I can overcome this because it's been there so long," pains decreased to a 4.

In the remaining 4 sessions Bella continued to work on the aforementioned issues, with increasing benefits in the phone sessions and on her own, between sessions. She was often able to reduce her pains to zero. She also learned to install positive cognitions and feelings, such as the following, and to build them up to a 10 or even higher:

> I am happy for my daughter.
>
> I am confident the work we put into the wedding preparations will bear fruit.
>
> Thank you to my body for helping me be present in this moment.

Bella is very typical of the majority of participants in this study. She was initially focused on physical causes and contributors to pain, and expected to use WHEE primarily for direct pain relief. However, as she explored the benefits of WHEE she preferred to use WHEE to address the factors that contributed to her pain and made it harder to tolerate the pain.

A Sampling of Study Participants' Reports

WHEE is a very flexible tool, adaptable to each person's situation, symptoms, and needs. The following are a few comments to illustrate some of the ways the participants found it helpful. (Numbers refer to the order of listing in Table 1.)

1A. "Adele" (assumed name) is a 53 year-old woman, emotionally sensitive, working as a professional caregiver. She suffered emotional traumas in childhood due to parents' constant arguments, with resultant low self-esteem. She suffered from osteoarthritis for about 20 years, following separate physical traumas to her knee and wrist, plus a whiplash injury to her neck. Adele suffered from chronic fatigue syndrome (CFS)/fibromyalgia (FM) for 2 years, especially in her shoulders and back. She reported at the end of her participation in the WHEE study,

> I have a lot less pain and I'm calmer now. It was especially helpful to be able to reduce the intensity of emotional pain from traumas throughout my life; to be able to sleep better; and to install positive thoughts and feelings to replace negative ones arising in my current life, as well as ones that had plagued me for a long time.

3B. "Betty" is a 45-year-old woman, professional caregiver, who struggled with being overweight from early childhood. She reached a maximum 300 pounds till starting to gain self-awareness 2 years ago. Betty now weighs 250 lbs. She suffered from diabetes mellitus for 35 years and hypothyroidism for 14 years. She struggled with depression for 3 years since having to leave work due to FM, with pains in both sides of her neck, upper chest, hands, low back, knees, and thighs. She is working to put off hip replacement. Betty reported after 6 WHEE sessions: "I have less pain and am sleeping better. I don't feel as confused as I did before. WHEE gives me a concrete way to keep my mind busy in positive ways. I feel increased competence to deal with problems."

5B. "Charmaine" is a 29-year-old office worker, single mother of 8- and 10-year-old children who were often stressing her by arguing with each other. She was in chronic conflict with her ex-partner, father of her children. Charmaine had been sexually abused as a child. She suffered an auto accident with severe back injury at age 18; auto accidents with concussions at 25 and 26; and had surgery for pelvic inflammatory disease at 27, with unanticipated removal of her fallopian tubes. Wearing high heels started pain in her knees, spread to ankles, hips, back, wrists, fingers, and neck. She suffered separate abdominal pains following her surgery. A slow, dull ache pervaded the rest of her body. FM was diagnosed 10 years prior to Charmaine's participation in the study, with pain varying from bearable to debilitating. She had used multiple pain medications and antidepressants, all of which provided minimal benefits but produced intolerable side effects. Benefits of WHEE exceeded all Charmaine's expectations, including being pain free over increasing lengths of time; abatement of anger and sadness over losing her fallopian tubes; releasing anger over sexual abuse in childhood; getting along better with the father of her children. She started teaching her son to use WHEE, with marked improvements in his behaviors at school and home.

Not unexpectedly, improvements in the participants appeared to correlate with the regularity and frequency of uses of WHEE. Some of the participants who were feeling debilitated by their chronic pains and CFS/FM found it difficult to muster the energies to practice regularly. The brain fog of CFS/FM also contributed to distractibility and

weakened abilities to follow through on clinical instructions and participant intentions.

Discussion

The findings from this study suggest that WHEE may be helpful in decreasing pain, depression, and anxiety. This method shows promise as a new, innovative, hybrid intervention, worthy of additional investigation. During the randomized phase of the trial, WHEE patients showed clear benefits to their depression and anxiety. These effects were replicated in the wait-list-turned WHEE patients in the second phase of the study. Depression showed statistically significant effects in the wait-list-turned WHEE subsample. Anxiety decreases, though not statistically significant, appeared virtually identical to those of the first WHEE group's trend line. The only exception was that 1- and 3-month follow-up anxiety levels returned to baseline levels in the wait-list-turned WHEE replication group. Why the divergence of anxiety and depression levels occurred is unclear. It is possible that the waiting period may have unduly affected anxiety or some unknown carryover effect is responsible for this finding. WHEE did not reduce pain in the WHEE intervention group in the randomized phase of the trial, but in the wait-list-turned-WHEE group it did appear to reduce pain severity at 4 and 6 week assessments, but these benefits to pain did not persist to 1- and 3-month follow-up assessments. Similar effects appeared for pain interference, but statistical findings only approached, but did not attain, significance. Interestingly, decreases in pain severity and in pain interference that were demonstrated in the wait-list-turned WHEE group approximated the necessary 2 point change required to be deemed a minimum clinically important difference in fibromyalgia patients.[45] Though a majority of our sample were diagnosed with fibromyalgia, not all were, and most also had comorbid disorders. Hence, it can be cautiously concluded that in the wait-list-turned-WHEE group the decrease in pain was statistically reliable and clinically important for both pain severity and for pain interference.

The severity of suffering in people with chronic pain may be difficult for others to appreciate. This is particularly true for individuals who develop CFS/FM, with multiple pains, depression, anxiety, "brain fog," weakness, and insomnia.[43,44] Secondary stress often results from these conditions. For instance, CFS/FM patients often experience social isolation, with disdain of relatives and friends who are unable to provide relief and are put off by the chronic depression and suffering of the patients, often ending up disparaging the patients as being lazy, shirking, or overreacting. This creates a vicious circle of increasing depression and despair in the pain sufferers.[45,46] Added to this is frustration with the ineffectiveness of medications in fully addressing pain, anxiety, and depression and debilitating side effects of the medications. In contrast to these common experiences, patients in the present study reported to the WHEE instructor how rewarding it was to have effective self-healing tools available as needed, 24/7, without negative side effects.

The incidental finding that out of 21 patients with available information, 67% had suffered emotional traumas in childhood and 82% in adulthood suggests that emotional trauma may be a precursor for the development of chronic pain, and this appears worthy of further study. An internet search revealed support in similar findings from other reports.[47-49] For example, an online survey of over 2400 women in chronic pain was conducted by *National Pain Report* and For Grace, a nonprofit devoted to better care and wellness for women in pain. "Seven out of 10 women with chronic pain report having one or more incidents of childhood trauma ... [and] nearly half the women had experienced emotional abuse as children."[47]

In summary, the present findings are consistent with previous work showing WHEE benefits for test anxiety in college students.[22,30] WHEE appears largely effective in reducing depression and anxiety above maintenance pharmaceutical treatment in chronic pain patients. This suggests that in addition to beneficial effects in healthy and young populations of college students, WHEE shows potential for being an efficacious integrative medical approach in chronic pain patient populations. The promising effects of WHEE shown in the present study are consistent with and supportive of the work showing that EMDR and EFT are effective strategies for coping with a variety of mental and physical health problems.[14,15,17-20,22-30,50] This is as expected, because WHEE is a hybrid approach developed out of the methods of EMDR and EFT.

That WHEE shows promising effects for depression and anxiety but not as much for pain is unexpected but perhaps not unexplainable. Patients were invited at each lesson to use WHEE on whatever was bothering them most. Many were to some extent resigned to living with their pain. Many chose to focus their uses of WHEE on the current stressors in their lives that were making them anxious and depressed and thereby heightening their sensitivity and irritability in response to pain. With the volatility of pain symptoms and their impact on functioning,[51] it may well be that to detect the effect of WHEE amid such noise, larger samples, longer series of WHEE lessons, and greater patient group homogeneity may be necessary to increase statistical power. Encouraging participants to focus specifically on their pain could also enhance WHEE benefits for pain. Nevertheless, it is important to underscore the importance of offering an efficacious self-treatment method that is nonpharmaceutical in nature, has no side effects, can be easily learned and used, and can be effective in reducing the burdens associated with chronic pain. It remains to be determined if scientific evidence will bear out clinical observations of pain relief resulting from WHEE. It is clear that quality of life enhancement is a very likely outcome of WHEE in chronic pain patients and additional measures of quality of life would be well worth including in further WHEE research.

As with any intervention study, there are limitations to consider. First, despite instructions and repeated encouragement to practice WHEE, many participants reported practicing only a few times between lessons and following completion of the series of 6 lessons. It appears that the conventional mindset of expecting the therapist to "fix" their problems may have

prevailed for many of the patients, with the concomitant lack of preparedness to engage in self-care methods for reductions of pain, anxiety, and depression. Other factors that may have predisposed them to avoid reducing their pain include the presence of secondary gains plus other nonspecific factors such as low expectations of change often prevalent in people with chronic illness.[52] They therefore likely did not attain the maximal possible benefits. Second, patients in this convenience sample were recruited from a private psychiatric practice and included a majority with the diagnosis of CFS/FM (17 of 24 subjects). CFS/FM includes a particularly resistant combination of symptoms and may not be representative of chronic pain patients in general. Third, sample size was modest, which limited the power of the statistical analyses. Larger scale and multicenter medical trials would be helpful next steps to address this limitation. Fourth, though key assessments of depression, anxiety, and pain were included, other outcomes that might have been positively affected by WHEE were not measured. For instance, WHEE may change chronic pain patients' outlooks on life, improve optimism, hope, locus of control, or enhance self-efficacy—variables that have all been consistently related to better health.[53] Likewise, it would be helpful to examine the role of nonspecific factors, including an assessment of subjects' expectation of success.

The changes in depression and anxiety observed in this study appear worthy of further follow-up. Future research should consider a wide array of functional variables in order to best determine what outcomes are positively affected by WHEE. Future studies should also measure the functional impact of the treatment, separate from any change in pain ratings (via SF-36 or SA-45 or other suitable assessment tools).

WHEE is a new, innovative, hybrid intervention that shows promising results in patients with chronic pain. Despite its limitations, the present pilot study is the first to document benefits of WHEE in this patient population. Given the prevalence of mental health problems in chronic pain patients, efficacious treatments for these multiple, complex issues are important to develop. Continued attention to integrative approaches to pain relief will undoubtedly result in enhancements to multidisciplinary treatment of pain and the development of efficacious coping strategies for chronic pain patients. Future work would do well to continue to focus on refining the evidence base on such methods, establishing criteria for clinically significant results, and clarifying mechanisms of action.

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Author Contributions

Daniel Benor organized and supervised the study, provided the WHEE interventions, and wrote the paper. John Rossiter-Thornton screened and selected the patients from his private practice and provided clinical follow-ups for conventional medical maintenance therapy. Loren Toussaint provided statistical analyses, wrote-up the results, and assisted with writing, editing, and formatting the paper.

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Ethical Approval

Ethical approval was obtained prior to the commencement of the study.

References

1. Gaskin DJ, Richard P. The economic costs of pain in the United States. *J Pain*. 2012;13:715-724.
2. Esquibel AY, Borkan J. Doctors and patients in pain: conflict and collaboration in opioid prescription in primary care. *Pain*. 2014; 155:2575-2582.
3. Lauwerier E, Paemeleire K, Van Damme S, Goubert L, Crombez G. Medication use in patients with migraine and medication-overuse headache: the role of problem-solving and attitudes about pain medication. *Pain*. 2011;152:1334-1339.
4. Turk DC, Rudy TE. Neglected factors in chronic pain treatment outcome studies–referral patterns, failure to enter treatment, and attrition. *Pain*. 1990;43:7-25.
5. Sullivan MD, Von Korff M, Banta-Green C, Merrill JO, Saunders K. Problems and concerns of patients receiving chronic opioid therapy for chronic non-cancer pain. *Pain*. 2010;149:345-353.
6. Turner JA, Calsyn DA, Fordyce WE, Ready LB. Drug utilization patterns in chronic pain patients. *Pain*. 1982;12:357-363.
7. Von Korff M, Galer BS, Stang P. Chronic use of symptomatic headache medications. *Pain*. 1995;62:179-186.
8. National Institute of Mental Health. Mental health medications. http://www.nimh.nih.gov/health/topics/mental-health-medications/index.shtml. Accessed January 2016.
9. Artus M, Croft P, Lewis M. The use of CAM and conventional treatments among primary care consulters with chronic musculoskeletal pain. *BMC Fam Pract*. 2007;8:26.
10. EMDR Institute Inc. www.emdr.com. Accessed July 4, 2016.
11. Craig G, Craig T. Official EFT tutorial. http://emofree.com/eft-tutorial/eft-tapping-tutorial.html. Accessed July 4, 2016.
12. Benor DJ. *Seven Minutes to Natural Pain Release: Pain Is a Choice and Suffering Is Optional—WHEE for Tapping Your Pain Away*. Bellmawr, NJ: Wholistic Healing Publications; 2009.
13. Benor D. *WHEE for Wholistic Healing Workbook*. Bellmawr, NJ: Wholistic Healing Publications; 2008.
14. Bisson JI, Roberts NP, Andrew M, Cooper R, Lewis C. Psychological therapies for chronic post-traumatic stress disorder (PTSD) in adults. *Cochrane Database Syst Rev*. 2013;(12): CD003388.
15. EMDR International Association. EMDR related research. http://www.emdria.org/?page=EMDRResearch. Accessed January 2016.
16. Feinstein D. Rapid treatment of PTSD: why psychological exposure with acupoint tapping may be effective. *Psychotherapy (Chic)*. 2010;47:385-402.

17. Brattberg G. Self-administered EFT (emotional freedom techniques) in individuals with fibromyalgia: a randomized trial. *Integr Med*. 2008;7(4):30-35.
18. Feinstein D. Acupoint stimulation in treating psychological disorders: evidence of efficacy. *Rev Gen Psychol*. 2012;16:364-380.
19. Church D, Brooks AJ. The effect of a brief EFT (emotional freedom techniques) self-intervention on anxiety, depression, pain and cravings in healthcare workers. *Integr Med*. 2010;9(5):40-44.
20. Rowe JE. The effects of EFT on long-term psychological symptoms. *Couns Clin Psychol*. 2005;2(3):104-111.
21. Church D, De Asis MA, Brooks AJ. Brief group intervention using emotional freedom techniques for depression in college students: a randomized controlled trial. *Depress Res Treat*. 2012;2012:7.
22. Benor DJ, Ledger K, Toussaint L, Hett G, Zaccaro D. Pilot study of emotional freedom techniques, wholistic hybrid derived from eye movement desensitization and reprocessing and emotional freedom technique, and cognitive behavioral therapy for treatment of test anxiety in university students. *Explore (NY)*. 2009; 5:338-340.
23. Schoninger B, Hartung J. Changes on self-report measures of public speaking anxiety following treatment with thought field therapy. *Energy Psychol Theory Pract Res*. 2010;2(1):13-26.
24. Sezgin N, Özcan B. The effect of progressive muscular relaxation and emotional freedom techniques on test anxiety in high school students: a randomized blind controlled study. *Energy Psychol Theory Res Treat*. 2009;1(1):23-29.
25. Temple G, Mollon P. Reducing anxiety in dental patients using emotional freedom techniques (EFT): a pilot study. *Energy Psychol Theory Res Treat*. 2011;3:53-56.
26. Swingle PG, Pulos L, Swingle MK. Neurophysiological indicators of EFT treatment of post-traumatic stress. *Subtle Energies & Energy Medicine Journal Archives*. 2004;15(1):75-86.
27. Church D. The treatment of combat trauma in veterans using EFT (emotional freedom techniques): a pilot protocol. *Traumatology*. 2010;16:55-65.
28. Church D, Geronilla L, Dinter I. Psychological symptom change in veterans after six sessions of emotional freedom techniques (EFT): an observational study. *Int J Healing Caring*. 2009;9:1.
29. Karatzias T, Power K, Brown K, et al. A controlled comparison of the effectiveness and efficiency of two psychological therapies for posttraumatic stress disorder: eye movement desensitization and reprocessing vs. emotional freedom techniques. *J Nerv Ment Dis*. 2011;199:372-378.
30. Armstrong L. *A Validation Study of WHEE as a Therapeutic Intervention for Alleviating Test Anxiety* [Unpublished thesis]. Sausalito, CA: Energy Medicine University; 2010.
31. Campbell CM, Edwards RR. Mind–body interactions in pain: the neurophysiology of anxious and catastrophic pain-related thoughts. *Transl Res*. 2009;153(3):97-101.
32. Cleeland CS, Ryan KM. Pain assessment: global use of the Brief Pain Inventory. *Ann Acad Med Singapore*. 1994;23:129-138.
33. Daut RL, Cleeland CS, Flanery RC. Development of the Wisconsin Brief Pain Questionnaire to assess pain in cancer and other diseases. *Pain*. 1983;17:197-210.
34. Keller S, Bann CM, Dodd SL, Schein J, Mendoza TR, Cleeland CS. Validity of the brief pain inventory for use in documenting the outcomes of patients with noncancer pain. *Clin J Pain*. 2004;20: 309-318.
35. Tan G, Jensen MP, Thornby JI, Shanti BF. Validation of the Brief Pain Inventory for chronic nonmalignant pain. *J Pain*. 2004;5: 133-137.
36. Tittle MB, McMillan SC, Hagan S. Validating the brief pain inventory for use with surgical patients with cancer. *Oncol Nurs Forum*. 2003;30:325-330.
37. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association; 1994.
38. Beck AT, Steer RA, Brown GK. *Manual for the Beck Depression Inventory–II*. San Antonio, TX: Psychological Corporation; 1996.
39. Zung WWK. A rating instrument for anxiety disorders. *Psychosomatics*. 1971;12:371-379.
40. Bolger N, Laurenceau JP. *Intensive Longitudinal Methods: An Introduction to Diary and Experience Sampling Research*. New York, NY: Guilford Press; 2013.
41. Heck RH, Thomas SL, Tabata LN. *Multilevel and Longitudinal Modeling With IBM SPSS*. New York, NY: Routledge; 2013.
42. Singer JD, Willett JB. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. New York, NY: Oxford University Press; 2003.
43. Sharpe MC, Archard LC, Banatvala JE, et al. A report—chronic fatigue syndrome: guidelines for research. *J R Soc Med*. 1991;84: 118-121.
44. Zoppi M, Maresca M. Symptoms accompanying fibromyalgia. *Reumatismo*. 2008;60:217-220.
45. Kappesser J, Williams AC, Prkachin KM. Testing two accounts of pain underestimation. *Pain*. 2006;124:109-116.
46. Nordgren LF, Banas K, MacDonald G. Empathy gaps for social pain: why people underestimate the pain of social suffering. *J Pers Soc Psychol*. 2011;100:120-128.
47. National Pain Report. Childhood trauma and adult pain: is there a connection? http://nationalpainreport.com/childhood-trauma-and-pain-is-there-a-connection-8824829.html. Accessed July 4, 2016.
48. Otis JD, Keane TM, Kerns RD. An examination of the relationship between chronic pain and post-traumatic stress disorder. *J Rehabil Res Dev*. 2003;40:397-406.
49. Polusny MA, Follette VM. Long-term correlates of child sexual abuse: theory and review of the empirical literature. *Appl Prev Psychol*. 1995;4:143-166.
50. Grant M, Threlfo C. EMDR in the treatment of chronic pain. *J Clin Psychol*. 2002;58:1505-1520.
51. Toussaint L, Vincent A, McAllister SJ, Whipple M. Intra- and inter-patient symptom variability in fibromyalgia: results of a 90-day assessment. *Musculoskeletal Care*. 2015;13:93-100.
52. Ross CK, Frommelt G, Hazelwood L, Chang RW. The role of expectations in patient satisfaction with medical care. *J Health Care Mark*. 1987;7(4):16-26.
53. Kern ML, Friedman HS. Personality and pathways of influence on physical health. *Soc Pers Psychol Compass*. 2011;5(1):76-87.