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FIBROMYALGIA (MFP PERES, SECTION EDITOR)

The Effects of Meditation-Based Interventions on the Treatment of Fibromyalgia

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Abstract Meditation is the third most commonly requested complementary and alternative medicine (CAM) therapy reported in a US survey. Those who suffer from chronic pain are those who most frequently use CAM therapies. This review aims to evaluate whether meditation-based interventions can help the treatment of fibromyalgia. A PubMed search was conducted using the terms "fibromyalgia" and "meditation", or "mindfulness", or "mantra" or "relaxation response". We selected articles which clearly described a meditation intervention being used in the treatment of fibromyalgia. Only four articles were classified with score 3 in the Jadad scale. Another seven articles were included in this review. Most of the results indicate improvement in fibromyalgia-related symptoms in patients who participated in a meditation-based intervention. Considering only 4 of the 13 studies achieved a score of 3 on the Jadad scale, researchers of meditation interventions should discuss the best methodologic control for these studies.

Keywords Fibromyalgia · Meditation · Mindfulness · Pain

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Introduction

In 1990, the American College of Rheumatology established a classification criteria for fibromyalgia which includes having pain in more than three locations in the body for more than three months, accompanied by specific tender points. In total, 18 points were defined—9 on each side of the body. On one hand, a diagnosis of fibromyalgia can then be made when there is severe discomfort in the presence of pressure applied to 11 out of 18 of these tender points [1]. On the other hand, however, there is no "gold standard" for diagnosing fibromyalgia and no specific laboratory test for it. As a result, it can be sometimes difficult to distinguish fibromyalgia from other central pain disorders, such as chronic fatigue syndrome [2].

It is also important to note the high prevalence of psychiatric disorders in patients with fibromyalgia. An attempt to develop a scale in order to diagnose fibromyalgia which does not require a physical or tender point examination

considered not only pain, but also psychological problems, such as anxiety and depression [3••]. Sleep disorders are also common in fibromyalgia patients and pharmacological and nonpharmacological strategies have been used in the treatment [4].

The fact that there is no apparent cure for chronic pain and that, for many patients, Western medicine is not sufficient to relieve it's symptoms, possibly explains why chronic pain is the condition for which complementary and alternative medicines (CAMs) have most frequently been used by US adults. In a recent review, balneotherapy and mind–body therapies appear to be some of the most promising CAM therapies for fibromyalgia [5•]. Most CAM users are females with high levels of education and high incomes. According to a US national survey, 38.3 % of adults use CAMs and the third most commonly requested CAM therapy by those with different diagnoses is meditation—a mind–body therapy [6].

Meditation is a self-induced procedure that uses a defined technique involving logic relaxation. Meditation may also involve a state of psychophysical relaxation in the process, a self-focusing skill or anchor, an altered state/mode of consciousness, mystic experience, enlightenment or suspension of logical thought processes, be embedded in a religious/spiritual/philosophical context or involve an experience of mental silence [7].

It has been shown that meditation practices seem to improve acceptance of life events and attentional abilities [8, 9]. The acceptance process is important in pain-management. Diagnosis, social support, educating self and others, and self-care are all factors that promote acceptance. Struggling to retain a pre-pain identity, a negative impact on relationships, the non-acceptance of the pain by others and the idea that the pain is "all in their head" are all barriers to acceptance [10]. In a study comparing fibromyalgia, rheumatoid arthritis and musculoskeletal pain patients, fibromyalgia patients were more anxious and somatically aware than rheumatoid arthritis or musculoskeletal pain patients. All groups of chronic pain patients had impaired cognitive functioning in a neuropsychological test of everyday attention [11].

In a study about possible pain mechanisms stimulated by meditation, reductions in pain intensity induced by meditation practice were associated with increased activity in areas involved in the cognitive regulation of nociceptive processing (anterior cingulate cortex and anterior insula) and meditation reduced pain-related activation of the contra lateral primary somatosensory cortex. Reductions in pain unpleasantness were associated with orbitofrontal cortex activation (which is implicated in reframing the contextual evaluation of sensory events) and with thalamic deactivation, which may reflect a gating mechanism modifying interactions between afferent input and executive-order brain areas [12••]. In another study, structural magnetic resonance imaging scans were performed and the temperature required to produce moderate pain was assessed in Zen meditators (who have been associated with low sensitivity on the affective and the sensory dimensions of pain) and non-meditators. Comparing groups, meditators were found to have thicker cortex in the dorsal anterior cingulate and bilaterally in secondary somatosensory cortex (regions associated with pain processing) [13].

Mindfulness Based Stress Reduction (MBSR) is one of the best known meditation-based programs in clinical settings. One review of MBSR included studies about chronic diseases, such as fibromyalgia, chronic pain, rheumatoid arthritis and cardiovascular diagnoses. Fifteen studies found that participation in a MBSR program resulted in improvements and no negative change was reported between baseline and follow-up. According to the review, participation in a MBSR program possibly contributed to coping better with symptoms, improved well-being and quality of life, and enhanced health outcomes [14].

This review aims to evaluate whether meditation-based interventions may help in the treatment of fibromyalgia.

Method

A PubMed search was conducted by cross-referencing the terms "fibromyalgia" and ("meditation" or "mindfulness", or "mantra" or "relaxation response"). The search was limited to English-language articles. We found 225 articles in the search and then selected the articles which clearly described that a meditation intervention was part of the fibromyalgia treatment in clinical trials.

Following that, we applied the Jadad scale, which analyzes the adopted criteria of randomization and allocation concealment (blinding), and monitors losses and/or deletions occurred. The Jadad scale is a numerical scale ranging from 0 to 5 in which 0 indicates null methodological quality, 1 indicates very low methodological quality, 2 indicates low methodological quality, 3 indicates regular methodological quality, 4 indicates good methodological quality and 5 indicates very good methodological quality [15].

Results

Only four articles were classified as a score 3 on the Jadad scale and are presented in Table 1. No articles achieved a score above 3 on this scale.

Another seven articles with interesting results were selected; however, they were not controlled or randomized [16–24].

Table 1 Articles with a score of 3 or more on the Jadad scale

Study	Patients		Treatment	Main outcomes
	n	Characteristics		
Schmidt et al. [28]	177	Women with fibromyalgia; randomized controlled trial	MBSR or active control group or wait list	Post hoc analyses showed that only MBSR manifested a significant pre-to-post-intervention improvement in HRQoL (P=0.02). In a three-armed randomized controlled trial in female patients suffering from fibromyalgia, patients benefited modestly from a mindfulness-based stress reduction intervention
Carson et al. [27]	53	Women with fibromyalgia; randomized controlled trial	Yoga of Awareness program (gentle poses, meditation, breathing exercises, yoga-based coping instructions, group discussions) or wait-listed standard care	At post-treatment, women assigned to the yoga program showed significantly greater improvements in measures of fibromyalgia symptoms and functioning, including pain, fatigue and mood, and in pain catastrophizing, acceptance and other coping strategies
Sephton et al. [26]	91	Women with fibromyalgia; randomized controlled trial	MBSR	Change in depressive symptoms was assessed using slopes analyses of intervention effects over time. Depressive symptoms improved significantly in treatment versus control participants over the three assessments
Astin et al. [25]	128	Patients with fibromyalgia; randomized controlled trial	Mind-body training (mindfulness meditation plus Qigong movement therapy) or education support group	Both groups registered statistically significant improvements across time for the FIQ, Total Myalgic Score, Pain and Depression, and no improvement in the number of feet traversed in the six-minute walk. There was no difference between the mind–body training group and the education control group. Salutary changes occurring by the eighth week were largely maintained by both groups throughout the six-month follow-up period

MBSR Mindfulness Based Stress Reduction, *HRQoL* Health-related Quality of Life, *FIQ* Fibromyalgia Impact Questionnaire

Discussion

The aim of this review was to evaluate whether meditation-based practices may help in the treatment of fibromyalgia.

It was possible to observe that soon after the classification criteria of fibromyalgia were defined in 1990, a study on the effects of a meditation-based intervention on the treatment of the condition was conducted and published in 1993 [24], reflecting the interest of researchers and patients in the field of CAM. In this study, the mean scores of all the patients completing the program showed an overall improvement and 51 % showed moderate-to-marked improvement. A study published in 1998 which applied a program of mindfulness meditation and QiGong (a Chinese practice for energy balance) movements therapy, presented significant reductions in pain, fatigue and sleeplessness in fibromyalgia patients [23]. Another protocol with QiGong improved pain and fibromyalgia symptoms, and these improvements remained for at least four months of follow-up [22]. None of these studies were randomized controlled trials. Astin et al. [25] compared an intervention involving both a QiGong movement therapy together with mindfulness meditation against an education support group in a randomized controlled trial. Both groups improved in the Fibromyalgia Impact Questionnaire (FIQ) and in levels of pain; however, there were no significant differences between groups.

Depression symptoms are commonly identified in women with fibromyalgia. MBSR and a waiting-list control group were compared in a randomized study; depression symptoms were improved in the MBSR group [26].

A MBSR group compared with a social support group in a quasi-randomized trial had significantly greater results in visual analog pain, quality of life subscales, coping with pain, anxiety, depression and somatic complaints; three-year follow-up analyses of MBSR participants indicated sustained benefits [21].

The effect of MBSR on women diagnosed with conditions such as multiple chemical sensitivity, chronic fatigue syndrome and fibromyalgia were evaluated and compared with a waiting-list control group. The groups were not randomized. MBSR reduced psychological distress in women with these diagnoses compared with the control group [20].

After eight weeks of MBSR it was possible to register reduced basal electrodermal (skin conductance level) activity during meditation, consistent with reduced sympathetic nervous system activation [19].

Comparing the effects of MBSR between patients with arthritis, back/neck pain or two or more comorbid pain conditions, a significant change in pain intensity and functional limitations were found. Participants with arthritis showed the largest treatment effects for health related quality of life (HRQoL) and psychological distress. Patients with chronic headache/migraine experienced the smallest improvement in pain and HRQoL. Patients with fibromyalgia had the smallest improvement in psychological distress. It is important to notice that greater home meditation practice was associated with improvement on overall psychological distress, somatization symptoms and self-rated health [17].

In an uncontrolled study Rassmussen et al. [16, 18] observed the effects of Maharishi Vedic Medicine and Transcendental Meditation (the last one applied in part of the sample). The fibromyalgia patients showed significant improvements six months post-treatment in working ability, pain, tiredness, morning tiredness, stiffness, anxiety and depression. At 24 months, 4 subjects continued practicing Transcendental Meditation and had almost no fibromyalgia symptoms and significantly lower FIQ scores than the non-meditators on all outcomes.

The Yoga of Awareness program includes gentle poses, meditation, breathing exercises, yoga-based coping instructions and group discussions. A randomized controlled study compared it with wait-listed standard care in fibromyalgia patients. At post-treatment, women in the yoga program showed significantly greater improvements in measures of fibromyalgia symptoms and functioning, including pain, fatigue and mood. They also improved in pain catastrophizing, acceptance and other coping strategies [27].

In a three-armed randomized controlled trial comparing MBSR, an active control group or a wait list in female patients suffering from fibromyalgia, patients benefited modestly from the MBSR intervention. Basically, the MBSR manifested a significant pre-to-post-intervention improvement only in HRQoL [28].

From this review, it is possible to conclude that MBSR is the most investigated intervention, with promising results, for fibromyalgia.

Considering that there is evidence that meditation can relieve psychological symptoms [29], it is not surprising that there is an improvement in depression and anxiety symptoms in fibromyalgia patients.

Attentional control and acceptance are important components for pain-management [10]. Meditation is mental training of focused attention and development of more acceptance of life events [8]; it may contribute to the shift in the relationship between suffering and pain in fibromyalgia patients, thus improving their skills in pain management.

Considering the high percentage of CAM users and that meditation is one of the most applied interventions in this field, especially for chronic pain, it is important to conduct more randomized controlled studies to evaluate the effects of meditation-based interventions for fibromyalgia.

Conclusions

Most of the results indicate an improvement in fibromyalgia-related symptoms in patients who practised some kind of

meditation-based intervention. Considering that only 4 of the 13 studies achieved a score of 3 in this scale, researchers in meditation-based interventions should discuss the best methodologic control for their studies.

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