

# The Impact of a Meditation-Based Stress Reduction Program on Fibromyalgia

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**Abstract:** *Fibromyalgia is a chronic illness characterized by widespread pain, fatigue, sleep disturbance, and resistance to treatment. The purpose of this study was to evaluate the effectiveness of a meditation-based stress reduction program on fibromyalgia. Seventy-seven patients meeting the 1990 criteria of the American College of Rheumatology for fibromyalgia took part in a 10-week group outpatient program. Therapists followed a carefully defined treatment approach and met weekly to further promote uniformity. Patients were evaluated before and after the program. Initial evaluation included a psychiatric structured clinical interview (SCID). Outcome measures included visual analog scales to measure global well-being, pain, sleep, fatigue, and feeling refreshed in the morning. Patients also completed a medical symptom checklist, SCL-90-R, Coping Strategies Questionnaire, Fibromyalgia Impact Questionnaire, and the Fibromyalgia Attitude Index. Although the mean scores of all the patients completing the program showed improvement, 51% showed moderate to marked improvement and only they were counted as "responders." These preliminary findings suggest that a meditation-based stress reduction program is effective for patients with fibromyalgia.*

## Background

Stress reduction programs, geared to teaching patients how to live and cope with an illness, are a growing part of contemporary medical practice [1-3]. A variety of approaches including meditation, biofeedback, and cognitive therapy are used for these purposes [4-6]. A meditative approach, referred to as "mindfulness," is reported as being ef-

fective in the treatment of patients with chronic pain [7]. In a 4-year follow-up of this intervention, patients maintained therapeutic benefits [8].

Mindfulness meditation appears to combine the benefits of meditation with cognitive therapy. Similar to other forms of meditation, mindfulness meets the criteria outlined by Benson [9] and triggers the relaxation response. Similar to cognitive therapy, mindfulness meditation involves observation of one's cognitive processes. This meditative approach pays particular attention to "automatic thoughts" and their consequences. During meditation, the meditator acknowledges intruding thoughts but views them objectively as thoughts ("distancing") [10].

Mindfulness meditation also differs from cognitive therapy. Cognitive therapy is a structured and directive form of psychotherapy in which the goal is to help patients identify and correct maladaptive cognitions [10]. Mindfulness meditation is not a psychotherapy per se but a system of self-inquiry stemming from Buddhist philosophy and psychology [11]. Mindfulness leads to an increased awareness not only of one's thoughts but also of sensations, feelings, and consciousness. Mindfulness meditation, also referred to as "insight meditation," has as one of its goals an awareness of the nature of mental processes [11].

The practice of mindfulness meditation can have therapeutic benefits. In the treatment of chronic pain, the efficacy of this approach was attributed to an "uncoupling" of the sensory component of the pain from the cognitive and affective dimensions of the pain [7]. When change occurs, it is thought to occur as a result of desensitization similar to Wolpe's theory of reciprocal inhibition or by

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state-dependent learning in an altered state of consciousness [12].

Fibromyalgia is a chronic illness characterized by widespread pain, fatigue, and sleep disturbance [13,14]. There is considerable overlap between fibromyalgia and chronic fatigue syndrome [15]. The specific etiology of fibromyalgia is unknown. Although psychiatric factors, especially depression, are thought to play a role in fibromyalgia, the nature of this role remains unclear. Studies using a structured clinical interview schedule to diagnose according to the DSM-III criteria show that the majority of patients do not have a current Axis I diagnosis [16,17]. The symptoms of the illness lead to significant physical and psychological disability which is comparable to that of rheumatoid arthritis [18]. It is estimated that 6–10 million Americans meet current diagnostic criteria for fibromyalgia [13].

Treatment of fibromyalgia is often disappointing [19]. Randomized, controlled, therapeutic trials have demonstrated that tricyclic and other central nervous system medications are better than a placebo, but a clinically significant response has been reported in less than one-third of the patients [19–23]. Supervised cardiovascular fitness training [24], biofeedback [25], and hypnotherapy [26] are superior to placebo, but the majority of patients continue to have persistent pain, fatigue, and sleep disturbances [27].

Recent studies using psychosocial interventions, albeit uncontrolled, have been more promising. Burckhardt et al. [35] reported at the annual meeting of the American College of Rheumatology in November 1991 on a 6-month outpatient multidisciplinary treatment approach to fibromyalgia with an overall 66% improvement rate. McCain et al. [24] reported at that same meeting a statistically significant improvement in the psychological variables in fibromyalgia with a 3-week inpatient cognitive behavioral treatment program. Butler et al. [28], treating chronic fatigue syndrome using cognitive behavior therapy, report substantial improvement in overall disability, fatigue and somatic and psychological symptoms. Seventy percent of the patients completing the treatment described themselves as being “better” or “much better.” These ratings, however, include patients with minimal and little improvement.

The specific purpose of this study was to assess the effectiveness of a mindfulness meditation-based stress reduction program in the treatment of fibromyalgia.

## Methods

Patients were selected in the following manner: Approximately 300 random fibromyalgia patients, diagnosed and followed by a rheumatologist (DLG), were mailed a letter outlining the Mind-Body Stress Reduction Program (MBSRP). They were asked to respond by phone or mail if they wished to enroll in the program. Each patient who enrolled met the 1990 criteria of the American College of Rheumatology for fibromyalgia [29]. Each patient had been seen by the rheumatologist at least once during the preceding 12 months. The rheumatologist provided each patient with education about fibromyalgia, placed them on medications, and gave them instruction about exercise. No changes were made in any treatment plans during the MBSRP. Space in the program was assigned on a first-come, first-serve basis. The first 77 patients who enrolled in the program were evaluated for this study.

Prior to the first meeting, patients were seen by either a psychiatric nurse (MGN) or psychiatrist (KHK) to screen for psychiatric illness and to learn of the patient's expectations of the MBSRP. Each patient was asked to undergo a structured clinical interview (SCID), which provided current and past psychiatric diagnoses according to DSM-III-R criteria [30]. Many patients refused, however, because of additional cost or other unstated reasons. During the screening interview, patients were told that homework was a necessary part of the program and would require about 50 minutes/day. It was acknowledged that finding time for home practice might be perceived as “stressful.” Patients were advised not to sign up for the course if they could not commit to the home practice. Prior to the first group session, the patients were given a packet of questionnaires.

Each patient completed the following questionnaires just before the first session and at the completion of the 10-week program:

1. A 100-mm visual analog scales (VAS) for global well-being, pain, sleep, fatigue, and feeling refreshed in the morning. Each item was scored on a 0–100-mm scale, with higher scores reflecting greater symptoms. The VAS has previously been used in fibromyalgia therapeutic trials and was found to be sensitive to change and to correlate with tender point scores on physical examination [31].
2. A Medical Symptom Checklist (MSCL) of 31

**Table 1.** Results in the mind body stress reduction program (MBSRP)

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Entered program = 77
Completed program = 59 (77%)
Responders <sup>a</sup> = 30 (51%)
Marked responders <sup>b</sup> = 11 (19%)

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<sup>a</sup>Responder = 25% improvement on >50% of 10 outcome measures.

<sup>b</sup>Marked responders = 50% improvement on >50% of 10 outcome measures.

items. Only those symptoms that were rated as bothersome on a daily basis were counted [32].

3. The General Severity Index (GSI) of the SCL-90, used as a global measure of psychological distress and representing the sum of 90 items, each rated on a 0–4 scale, and then divided by 90 [33].
4. The Coping Strategies Questionnaire (CSQ). For this study, use of the CSQ was limited to the mean of the two Likert scales of 0–6, which measures the patient's perception of ability to control and decrease pain [34].
5. The Fibromyalgia Impact Questionnaire (FIQ), which measures health status and functional disability. This is a 10-item questionnaire where each item can receive a maximum of 10 points (scoring range 1–100). Higher scores represent greater symptoms and disability [35].
6. Fibromyalgia Attitude Index (FAI) which is a 15-item scale, adapted from the Arthritis Helplessness Index [36]. The total scores have a range of 15–60, with higher scores indicating greater perceived helplessness.
7. Overall Assessment (OA) of Outcome Questionnaire which is the mean of a 10-item questionnaire with each item rated on a 1–5 scale—5 showing great progress, 3 no change, and 1 major worsening. All individuals scoring less than 3.5 were assigned to the no-improvement category [7].

The MBSRP was modeled on a program developed and described by Kabat-Zinn at the University of Massachusetts Medical Center [7,37]. The program was modified to include the specific concerns of the fibromyalgia patient—pain, sleep, and fatigue. Patients met in groups of 7–12, once a week for 2 hours per session for 10 consecutive weeks. Each therapist followed a standardized treatment program. Initial sessions involved both therapists and included a postsession conference to promote uniformity in the program. Patients were given au-

diotapes which included a sitting meditation, body scan, imagery and fatigue meditation. Each tape was a 20-minute meditation. Patients were instructed to meditate twice daily: late mornings before lunch and late afternoons before dinner. The patients were also encouraged to keep a written journal. In addition, there was approximately 10 minutes per day of mindfulness homework. Sessions had the following format:

1. meditation;
2. unstructured discussion in which patients discussed their experience with either their meditation practice, homework assignments, or fibromyalgia;
3. structured presentation, in which the group leader presented new material;
4. homework assignments and supplementary readings. Homework involved the implementation of stress reduction skills learned in class.

The course first focused on physical reactions to stressors. Gentle stretching, breathing exercises, and imagery were introduced. The focus then shifted to reactions to social stressors, specifically work and interpersonal relationships. Patients were encouraged to assert themselves regarding their fibromyalgia care, and homework was assigned for that purpose [38]. Homework for sessions 5–8 was written out and passed in. The focus of the course then shifted to psychological reactions to stressors. Patients paid attention to their cognitive and affective reactions to stressors, and written homework was assigned for that purpose [10]. The course ended with emphasis on the role of kindness and friendliness to oneself and its effect on fibromyalgia.

## Results

Fifty-nine of the 77 patients (77%) completed the program (Table 1). Most of the dropouts occurred in the early stages of the program. Most patients dropped out after just one or two sessions, having determined that they were not interested in the program at that time.

The mean scores for all 59 patients who completed the MBSRP program showed a positive change in each of the 10 instruments administered (Table 2). Improvement was measured as mean percent change and was modest in most of the instruments. There was concordance in the percentage of patients who showed change in each of these instruments, with a range of 58%–68% (Table 2).

**Table 2.** Results in all 59 patients who completed MBSRP<sup>a</sup>

Instruments (range)	Mean % change <sup>b</sup>	% Improved <sup>c</sup>
Visual analog scales (0–100 mm)		
Global well-being	7.9	64
Pain	8.0	65
Sleep	2.6	60
Fatigue	8.8	58
Tired upon awakening	8.5	60
FIQ (0–100)	6.4	68
FAI (15–16)	6.8	62
SCL-90-R (0–4)	37.0	63
Coping Strategies Questionnaires (0–6)	20.0	65
Medical symptom checklist (0–31)	23.0	66

<sup>a</sup>Mean values unless otherwise specified.

<sup>b</sup>All percentages are in positive (improvement) direction.

<sup>c</sup>Percentage of patients showing improvement on that scale.

Thirty of the 59 (51%) patients who completed the program were defined as “responders.” Responders were defined as showing 25% improvement in at least 50% of the 10 instruments used to measure change (Table 1). This included 11 of the 59 (19%) who were defined as “marked responders”—showing at least a 50% improvement in 50% of the instruments. Seven of the marked responders

**Table 3.** Responders vs non-responders in MBSRP<sup>a</sup>

	Responder (N = 30)	Non-responder (N = 29)
No. females	26 (87%)	27 (93%)
No. years education	15.7	14.1
Symptom duration (years)	6.2	6.8
No. employed	17 (57%)	8 (28%)
Psychiatric diagnosis (SCIDS)		
% Lifetime depression	60	71
% Current depression	10	14
% Past depression	50	57
% Other psych dx	20	29
Axis V (DSM-III-R)	76	70

<sup>a</sup>Mean values unless otherwise specified.

improved by more than 75% on each measure tested.

There were no significant differences in responders and nonresponders with regard to sex, years of education, age, or symptom duration. A greater number of responders were currently employed than nonresponders (Table 3). In general, we were unable to detect any difference between patients who signed up for the stress reduction program and fibromyalgia patients in the practice who were not involved in the study [39]. In general, patients were representative of other reports of fibromyalgia [16]. Thus, ninety percent were female, the average duration of symptoms was about 6 years, and less than 10% of patients were on disability. About two-thirds of the patients had a lifetime history of depression, but only 12% met DSM-III-R criteria for current major depression (Table 3). The responders had a mean change score that was significantly better than the nonresponders ( $p < 0.01$ ) in all instruments (Table 4).

Ninety percent of the patients considered that the MBSRP program provided them with valuable information and was of some or significant help in coping with their fibromyalgia. Two questions from the Outcome Questionnaire specifically addressed this question [7].

## Discussion

This study assessed the efficacy of a meditation-based stress reduction program for the treatment of fibromyalgia. The most important limitation of the study is that it was uncontrolled, with no control group for comparison purposes. It is also limited by not having follow-up data on patients completing the program. As a result, our findings must be interpreted cautiously, and improved study design is necessary. Despite these limitations, there are several important findings from this first study.

Our most important finding was that the majority of our patients showed a clinically significant improvement. The mean scores of *all* the patients showed a positive change on each instrument. In some patients, we believed the change was not of clinical significance. We therefore felt it was necessary to define “clinical significance,” which we defined as improvement of at least 25% in 50% of the outcome measures. Only those patients meeting these criteria were considered to have made a clinically significant improvement, and were referred to as “responders.” We further defined “marked

**Table 4.** Responders vs non-responders in MBSRP mean change scores<sup>a,c</sup>

Instruments (range)	Responders N = 30	Non-responders N = 29
Visual analog scale (0–100 mm)		
Global well-being	2.3	-1.02**
Pain	1.8	-0.34
Sleep	1.7	-1.40
Fatigue	2.4	-0.76
Tired upon awakening	1.9	-0.25
FIQ (0–100)	15.4	-6.38
FAI (15–60)	8.5	1.69
SCL-90R (0–4)	0.46	-0.13
Coping Strategies Questionnaire (0–6)	1.8	0.16
Medical symptom checklist (0–31)	5.9	-1.09

<sup>a</sup>Mean change score reflects actual values on each scale.

<sup>b</sup>Positive values reflect improvement; negative values reflect decline.

<sup>c</sup> $p < 0.01$  significant difference between responders and nonresponders on all measures.

improvement'' as improvement of at least 50% in 50% of the instruments. Eleven of our 59 patients (19%) met this criteria.

A greater number of responders were currently employed than nonresponders (Table 3). A retrospective analysis was unable to detect any differences in age, disability claims, or severity of illness upon entering the program. Since the completion of this initial study, our sample size has increased and employment status has not proved to be a significant variable.

Outcome measures were selected to assess patients from a biopsychosocial perspective. These included visual analog scales to assess physical change, the SCL-90 and Fibromyalgia Attitude Index to assess psychological change, and the FIQ to assess the social dimensions of work and disability. All of these instruments have been shown to be reliable and valid. Our findings indicate that there was not only improved coping in the psychosocial spheres, but also in the patient's physical condition as well. Thus, improvement was pervasive and cut across many parameters.

These findings show considerably better results than the traditional treatment for fibromyalgia. As mentioned earlier, previous results have shown a

clinically significant improvement rate of between 25% and 35%. These results have been disappointing and have led to a general pessimism in the treatment of fibromyalgia.

Our findings are comparable to recent reports of other stress reduction programs treating fibromyalgia, but our approach has certain advantages. It is a short-term (10 sessions), outpatient psychosocial intervention using a group format, which makes it both efficient and cost-effective. The use of one therapist throughout the 10 sessions fosters continuity, group cohesiveness, and interpersonal learning [40]. This approach emphasizes self-regulation and education.

These findings are encouraging and represent a new approach in the treatment of fibromyalgia. We are currently involved in a further study with improved design, which includes a comparison group and follow-up of patients completing the program. Our findings to date support the conclusions of this study, and our impression is that the meditation-based stress reduction program is beneficial in the treatment of patients with fibromyalgia.

*The authors wish to thank Jon Kabat-Zinn and Saki Santorelli for their support and encouragement in the development of the Mind Body Stress Reduction Program.*

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