

## ORIGINAL ARTICLE

# Effect of body awareness therapy on fibromyalgia syndrome in women: a randomized controlled trial

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**Purpose:** We aimed to investigate the effect of the Body Awareness Therapy (BAT) on physical symptoms, quality of life, and psychological status of women with fibromyalgia syndrome (FMS).

**Methods:** This study was a randomized controlled, long term follow-up study. Fifty-two women with FMS were randomly allocated to the study group (mean age: 39.5±7.06 years) or the control group (mean age: 36.5±9.3 years). Visual Analogue Scale (VAS) was used to evaluate pain, sleep disturbance and fatigue level. The Fibromyalgia Impact Questionnaire, Beck Depression Inventory and Nottingham Health Profile were used to investigate physical and mental status of patients. Two groups underwent the same physiotherapy program twice a week. In addition BAT was given to the study group and patient education and therapeutic exercises were given to the control group once a week for 2 months. Assessments were performed during and after treatment.

**Results:** Both treatment protocols were effective; however, study group has more improvement in quality of life, depression, and disability level ( $p<0.05$ ). Whereas results of pain, fatigue, and sleep disturbance intensity were similar between the groups ( $p>0.05$ ).

**Conclusion:** The most important effect of BAT was found to be on quality of life. We assumed that this is due to its enabling effects to control pain. The results imply that BAT may be used in addition to other physiotherapy and rehabilitation approaches in the treatment of FMS.

**Keywords:** Body awareness therapy, Fibromyalgia syndrome, Complementary therapy, Pain, Quality of life.

## Kadınlarda vücut farkındalığı tedavisinin fibromiyalji sendromuna etkisi: rastgele kontrollü çalışma

**Amaç:** Fibromiyalji sendromu (FMS) olan kadınlarda vücut farkındalığı tedavisinin fiziksel semptom, yaşam kalitesi ve psikososyal durum üzerine etkisini araştırmaktır.

**Yöntem:** Çalışma randomize kontrollü, uzun dönem izlem ile gerçekleştirildi. FMS tanısı almış 52 kadın hasta randomize olarak çalışma (yaş ortalaması 39.5±7.06 yıl) veya kontrol grubuna (yaş ortalaması 36.5±9.3 yıl) alındı. Ağrı, uyku düzensizliği ve yorgunluk seviyesi Vizüel Analog Skalası (VAS) ile değerlendirildi. Fibromiyalji Etki Anketi, Beck Depresyon Envanteri ve Nottingham Sağlık Profili kişilerin fiziksel ve mental durumlarını değerlendirmek için kullanıldı. İki grup 2 ay boyunca haftada 2 kez aynı fizyoterapi programını aldı. Çalışma grubuna ek olarak haftada bir vücut farkındalığı tedavisi, kontrol grubuna ise, hasta eğitimi ve egzersiz programı verildi. Değerlendirmeler tedavi başlangıcında ve bitiminde yapıldı.

**Bulgular:** Her iki tedavi etkili bulundu; ancak yaşam kalitesi, depresyon ve özür seviyesi sonuçları çalışma grubu lehine belirgin düzeyde farklı iken ( $p<0,05$ ), ağrı, yorgunluk ve uyku düzensizliği sonuçları iki grupta birbirine benzerdi ( $p>0,05$ ).

**Sonuç:** Vücut farkındalığının en önemli etkisinin yaşam kalitesi üzerine olduğu belirlendi. Bu durumun, hastalara hareketle ortaya çıkan ağrıyı kontrol etme becerisi kazandırdığı için ortaya çıktığını düşünmekteyiz. Vücut farkındalığı yaklaşımının fibromiyalji tedavisinde geleneksel fizyoterapi ve rehabilitasyon uygulamaları ile birlikte kullanılmasını önermekteyiz.

**Anahtar kelimeler:** Vücut farkındalığı tedavisi, Fibromiyalji Sendromu, Tamamlayıcı terapi, Ağrı, Yaşam kalitesi.

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**F**ibromyalgia syndrome (FMS) is a common form of chronic non-joint rheumatic pain which manifests itself by generalized pain and stiffness of the muscles and other soft tissues, as well as the presence of painful tender points sensitive to pressure in various characteristic areas.<sup>1</sup> Because of the relatively high prevalence, number of comorbidities, degree of disability and global severity, there is a significant burden of this disease.<sup>2,3</sup> The pathophysiology remains unknown, but there is increasing evidence that peripheral and central sensitization cause an amplification of sensory impulses that may alter pain perception in fibromyalgia patients. Interventions to treat fibromyalgia should aim at different targets simultaneously in order to reduce peripheral and central sensitization.<sup>4</sup>

Treatments to alleviate of symptoms were defined as difficult and temporary. It requires a multidisciplinary approach, using both pharmacological and non-pharmacological interventions.<sup>3,5,6</sup> In the literature, there were studies related to the effects of non-pharmacological treatments different management modalities such as exercise, EMG biofeedback training, electrotherapy, patient education, self-management programs,<sup>7</sup> massage techniques, cryotherapy, acupuncture, balneotherapy and spa therapy, cognitive-behavioral therapy, body-awareness therapy, chiropractic/osteopathic care, magnetotherapy, herbal and nutritional supplements.<sup>8</sup>

During the last 15 years, new methodologies have been developed in physiotherapy built on theories of body and mind in which the intention is to integrate bodily experiences with psychological insights and cognitive understanding.<sup>9</sup> Body awareness therapy (BAT) developed by Roxendal represents a relatively new approach for the multiple clinical settings in physiotherapy.<sup>10</sup> The BAT can be defined as body-oriented physiotherapeutic approaches using an holistic perspective in physiotherapy treatment directed towards an awareness of how the body is used, in terms of body function, behavior and interaction with self and others.<sup>11</sup> It focuses on the basic function of movements related to posture, coordination, free breathing and awareness that constitutes the basis for the quality of movement in action, the expression of the self, interaction with others and involvement in activities in life. Shortly, it aims

to integrate the body in the total experience of the self and to restore body awareness and body control.<sup>9-11</sup>

Physiotherapy for patients with psychosomatic disorders and pain conditions commonly include BAT.<sup>12</sup> This study aimed to investigate the effect of BAT program on physical symptoms, quality of life and psychological status of patients with FMS in the Turkish population context.

## METHODS

### Subjects

The study was conducted on 52 patients with FMS according to ACR criteria<sup>1</sup>. Besides fulfilling the ACR 1990 criteria for FM, the inclusion criteria were being women with ages ranging from 18 to 60 years, not being diagnosed to have a psychiatric illness, not having a secondary rheumatic or neuroendocrine disease which may cause secondary fibromyalgia and not receiving any other non pharmacological treatment than our program. Patients were recruited from the physiotherapy and rehabilitation department of the university. Seventy-two percent of the patients were taking analgesics on demand. Thirty-four percent of the patients received anti-depressive medicines or sedatives, which was not withdrawn because of medical and ethical considerations.

The average age of the women was  $38.36 \pm 7.03$  years. The mean symptom duration was  $5.6 \pm 3.2$  years. Fifty percent of them were working or studying either full-time or part-time. Random number generator was used in producing randomization schedules for the study. The patients were randomized to either a study group (N=27) or a control group (N=25). The patients were informed about the study and they were asked to fill in form stating that they voluntarily took part in the study. All the patients were asked not to change their medication during the study period. The study was approved by Hacettepe University Ethics Committee.

### Assessments

Fibromyalgia Impact Questionnaire (FIQ) was selected as a primary outcome measure.<sup>13</sup> Beck Depression Inventory (BDI) was used to state if patients were effected psychologically.<sup>14</sup> Quality of life of the patients were evaluated using the Nottingham Health Profile (NHP),<sup>15</sup>

and 100 mm anchored horizontal visual analogue scales (VAS) were used to evaluate pain, sleep disturbance and fatigue level during the day. All patients were evaluated at the onset of the program. Patients were reassessed after 3 months therapy and after 3, 6 and 9 months from discharge.

#### *Fibromyalgia Impact questionnaire (FIQ)*

The FIQ is a brief 10-item self-administered instrument. In the revised version of the FIQ, item 1 is composed of 11 sub items that make up the physical functioning scale. On items 2 and 3, patients indicate the number of days that they felt well or missed work (including housework) because of fibromyalgia symptoms. Items 4 through 10 are performed from 10 cm visual analogue scales marked in 1 cm increments on which the patients marks a work difficulty (including housework), pain, fatigue, morning tiredness, stiffness, anxiety and depression. Raw scores for items 4 through 10 can range from 0 to 10. The FIQ score range from 0 to 100 and a higher value indicates a higher impact of the disorder.<sup>13</sup>

#### *Beck Depression Scale (BDI)*

The BDI is a self-administered 21 item self-reported scale measuring supposed manifestations of depression. The BDI takes approximately 10 minutes to complete, although clients require a fifth – sixth grade reading age to adequately understand the questions.<sup>14-16</sup>

#### *The Nottingham Health Profile (NHP)*

Subjective health status was evaluated using the NHP questionnaire. NHP is a self-administered questionnaire with 38 items divided into six areas of health; energy (NHP-E), pain (NHP-P), emotional reactions (NHP-ER), sleep (NHP-S), social isolation (NHP-SI) and physical mobility (NHP-PM). All the parameters are summed as NHP total (NHP TOT). The respondent answers 'yes' if the statement adequately reflects the current status or feeling, or 'no' otherwise. The Turkish version of the NHP was administered.<sup>17</sup>

#### **Procedure**

Physiotherapy program were implemented by the same experienced physiotherapist twice a week for 2 months to both groups. In physiotherapy program heat modality (hotpack and ultrasound), massage and postural exercises were included. Control group received

patient education and continued therapeutic exercises whereas study group received BAT once a week for 2 months by two physiotherapists that attended to the courses of BAT. BAT program for all patients was comprised of various movements based on movements for daily living such as standing, walking, sitting and lying in combination with breathing exercises, relaxations, postural control, co-ordination and body awareness. The movements were individually modified to match the functional limitations of the patients. The 40 minutes sessions were completed with a short discussion about the movements.

Patients were asked to perform the exercises at home and they were trained on this aspect. After a three-month application, an assessment was done and patients were encouraged to go on doing BAT. Follow-up assessments were done after 3, 6 and 9 months treatment.

#### **Statistical analysis:**

All statistical tests were done using SPSS version 11.0 (SPSS Inc., Chicago, Illinois, USA). Wilcoxon's signed rank test was used in the intra-group analysis over time, while the Mann Whitney U test was used for inter-group analysis. Friedman's ANOVA by Ranks test (several samples) was used to state differences within group changes. All the tests were two tailed, and conducted at the 5% significance level.

## RESULTS

Demographic variables of the groups were assessed by the means, standard deviations and ranges. There were no group differences for age, disease duration and medicine intake ( $p>0.05$ ) (Table 1). In study group one patient did not follow the program and in control group there were 3 drop-outs. One of them did not come to the last assessment and others did not continue therapy after one month. There were also drop-outs during follow up, 6, 2 and 4 subjects consecutively.

The mean values of pain, fatigue, and sleep disturbance level, FIQ, BDI and NHP total scores are shown in Table 2. Fatigue and sleep disturbance was found to be more troubling than pain intensity in both groups. The onset assessment results were similar where only

pain intensity was higher in the controls and depression level was higher in study group ( $p < 0.05$ ). All parameters yielded statistically significant differences between first and second assessments in both groups ( $p < 0.05$ ), suggesting that both treatment protocols produced positive changes on symptoms (Table 2).

There was a statistically significant improvement in study group according to the results of the FIQ, NHP, and BDI ( $p < 0.05$ ) (Table 2). However the difference between groups in terms of pain, fatigue, and sleep disturbance levels were not statistically significant ( $p > 0.05$ ) (Table 2). Both treatment protocols had the same effect on the intensity of pain, fatigue and sleep disturbance; but quality of life, depression and disability level were more improved in the group receiving BAT.

**Table 1. Mean age and disease duration of the groups.**

	Study group (N=27) X±SD	Control group (N=25) X±SD	
Age (years)	39.5±5.0	36.5±9.3	*
Disease duration (years)	5.8±2.8	5.4±3.6	*

\*  $p < 0.05$ .

## DISCUSSION

Our study, which aimed to determine the short and long term effect of BAT, showed physiotherapy and BAT protocols had the same effect on the intensity of pain, fatigue and sleep disturbance. However quality of life, depression and disability level were better in the group receiving BAT.

The FMS patients present non-restorative sleep, poor sleep quality, and more fatigue compared to controls. Physical exercise causes improvement in pain, sleep, and even an increase of stage sleep.<sup>18</sup> Our study has also shown that physiotherapy program can decrease pain, fatigue and sleep disturbance as well as BAT program. The FMS patients are characterized by an altered cognitive processing of pain-related information and by an abnormal adaptation to mechanical

stimuli.<sup>19</sup> The stimulus given by both programs might cause the decrease in severity of pain which can thereby cause improvements in fatigue and sleep disturbances.

The FMS patients typically present complex symptoms and comorbid conditions, they cannot realistically be managed by primary care providers alone but require the assistance of multidisciplinary teams with expertise in a variety of physical, cognitive, behavioral, and educational strategies.<sup>20</sup> The first aim of treatment protocols are to control physical and physiologic factors like pain, but they should also aim to improve quality of life and psychosocial status of patients. Theadom et al, found that problem focused coping strategies do not directly improve physical health, delaying coping or not managing a stressful situation in some way is detrimental to physical functioning in FMS.<sup>21</sup> As some FMS patients may also be mentally deconditioned, a combined mind-body approach may have a synergistic effect: these therapies can address the mental barriers to improvement, whereas exercise changes the physiologic factors that contribute to FMS symptoms<sup>20</sup>. Our study showed the effect of BAT therapy on activity and participation level with significantly improving quality of life of patients compared to controls.

It is reported that as many as up to 80-90% of the patients indicate changes in daily life and decrease in quality of life due to FMS.<sup>9,22</sup> Although it is very important to decrease pain and other symptoms, it is valuable to prove the effect of treatment in relation to enhancement of body awareness and development of strategies to alter motor behaviors in activities of daily living. It is known that physiotherapy was beneficial for physical symptoms but BAT had a general effect on the body as it aimed to alter dynamic functions related to respiration, gait, and posture.

Previous studies which were done with FMS and musculoskeletal pain patients showed BAT increases quality of life and movement,<sup>23-25</sup> but not ratings of pain and symptoms.<sup>12,23</sup> The positive effect of BAT in terms of 'emotional reactions' such as anxiety, pain rating after activity, psychosomatic index and pain related medicine consumption compared with the controls has been shown<sup>26</sup>.

**Table 2. Comparison between values of before and after treatment.**

	Study Group		Control Group		
	Before treatment	After treatment	Before treatment	After treatment	
	X±SD	X±SD	X±SD	X±SD	
Fibromyalgia Impact Questionnaire	51.1±21.3	28.2±13.3	51.6±18.6	38.7±9.5	**
Pain (VAS, cm)	6.5±3.4	3.9±2.8	7.2±2.5	4.1±1.8	*
Fatigue (VAS, cm)	8±0.95	2.3±0.81	8.2±0.95	2.4±0.62	*
Sleep disturbance (VAS, cm)	8.2±0.76	2.6±0.84	8.1±0.76	2.4±0.71	*
Nottingham Health Profile	222.6±127.6	77.6±62.2	207.6±79.2	154.5±99.8	**
Beck Depression Inventory	22.5±6.4	11.8±3.8	12.5±7.5	7.8±7.6	**

p<0.05 Between before and after treatment in each group for all values. p>0.05 Between Study and Control groups for all before treatment values.

\* p>0.05 Between Study and Control groups for after treatment. \*\* p<0.05 Between Study and Control groups for after treatment.

Vegetative reactions were found to be improved with positive changes in grounding, centralization and flow.<sup>23</sup> A study revealed that the Basic BAT group experienced a greater improvement in pain and psychological symptoms than the other groups.<sup>24</sup>

When follow up results were compared with immediate results after treatment, there were no significant difference in pain, fatigue and FIQ scores and there was an increase in sleep disturbance and depression level. The increase in one of these factors may have influenced the other. Poor sleep quality is significantly predictive of pain, fatigue, and social functioning.<sup>21</sup> Disturbed sleep has been found to be associated not only with poor quality of life, but also with depressive symptoms.<sup>27</sup> It was also noted that sleep disturbance and fatigue was found to be more troubling than pain intensity in both groups.

It was observed that the number of studies related to BAT is quite limited. Studies emphasize the need of randomized controlled studies to state the effect of BAT.<sup>11</sup> Multidisciplinary rehabilitation program including BAT produced an improvement in health related quality of life and was more cost effective than the traditional treatment within long time perspective.<sup>28</sup>

One of the limitations of this study was low number of patients. However, BAT applications by therapists in our country were comparatively new and the study makes contribution to the field, it is essential to do follow-ups with larger groups. In order to have sustained effectiveness, it is important to enable patients to apply the program at their

daily life. Another limitation was that we do not know if subjects had continued their exercise in routine. Some of the study results may be related to not continuing exercises at home. We also did not have the chance to do follow up evaluation for the long term. It would be beneficial to compare results within long term.

The results of this study imply that further more controlled studies with larger sample sizes to support these findings. We concluded that BAT has short and long term positive effects and may be applied safely and effectively in addition to conventional physical therapy and rehabilitation approaches.

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**Conflict of interest:** *None.*

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