Effects of 2 Physiotherapy Programs on Pain Perception, Muscular Flexibility, and Illness Impact in Women With Fibromyalgia: A Pilot Study

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Abstract

Objective: This study assessed the effect of 2 physiotherapy programs designed to improve flexibility and to reduce the impact of the illness and pain perception in women with the fibromyalgia syndrome (FMS), and compared the effects of the 2 programs in the short and intermediate term.

Methods: Twenty FMS patients were randomly assigned to 2 training groups, one following a program of kinesiotherapy and active muscular stretching and one using techniques of Global Myofascial Physiotherapy, according to the Mézières method. Both groups met twice a week for 12 weeks, for a total of 150 minutes each week. Flexibility and illness impact were measured by means of a standard test, whereas pain was assessed by means of thumb palpation. Measurements were taken at the beginning and end of the program and 24 weeks after its end.

Results: Patients had achieved a statistically significant reduction in the severity of the disease and improved their flexibility level by the end of the program, but had returned to initial values after follow-up. Significant differences were not observed between the 2 treatment groups in the initial values or in the results at the end of the program or after the follow-up, so neither program proved better than the other.

Conclusion: The FMS patients in this study improved their flexibility level and general well-being using both kinesiotherapy and stretching exercises techniques. (J Manipulative Physiol Ther 2009;32:84-92)

Key Indexing Terms: *Rehabilitation; Fibromyalgia; Physiotherapy*

Fibromyalgia (FMS) is a syndrome of unknown etiology,[1] much research having been dedicated to assessing the efficacy of different therapies, especially nonpharmacologic and low-cost ones, in the reduction of the intensity of symptoms.[2] The primary symptom of FMS is widespread pain, typically associated with persistent fatigue and muscular weakness. As symptoms are often aggravated by a sedentary lifestyle and poor physical condition, along with the use of such antidepressants as selective serotonin reuptake inhibitors and cognitive behavioral therapy, physical activity is considered one of the 3 most evidence-based treatment approaches[3,4] According to the latest reviews of the effects of physical exercises programs on FMS, aerobic exercise programs have proven to be effective in reducing pain, fatigue, and the number of tender points (TPs),[5,6] whereas progressive strength training has proven to decrease the impact of the syndrome on the neuromuscular system, perceived symptoms, and functional capacity.[7] Despite the beneficial effects of different exercise training programs on FMS, very few studies have assessed the effectiveness of a program of physical activity based specifically on flexibility training.[8] Besides, an updated Cochrane review of FMS and exercise[9] concludes that there is "gold" level evidence that supervised aerobic exercise training has beneficial effects on physical capacity and FMS symptoms and that strength training may also have benefits, too. However, further studies on flexibility are needed.

Flexibility training could be a useful tool in the management of some FMS symptoms, such as muscular stiffness and lack of mobility, which considerably reduce quality of life (QoL).[10] Furthermore, there is clinical evidence that physical modalities such as flexibility training may help control muscle pain and muscular spasm, especially in concomitant muscular pain conditions, such as other myofascial syndromes.[11]

We hypothesized that a flexibility training program could offer a better QoL to FMS patients by reducing muscular pain and improving mobility. To assess the effect of our

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program, we chose a number of measuring tools commonly used in studies of this type. The impact of the illness on the QoL was assessed by means of the Functional Impact Questionnaire (FIQ), a sensitive tool capable of detecting changes in programs of this type.[12] The psychologic influence of our program was measured with the State Trait Anxiety Inventory (STAI), used to assess stress levels in populations with musculoskeletal pain.[13] Finally, to assess the specificity of the training proposed and any possible mobility gains, the sit-and-reach test was chosen, as it is simple to carry out and has shown acceptable levels of reliability and validity among FMS patients.[14] Finally, to assess possible changes at the level of muscular pain, the Tender Point Test was used, in accordance with the classification criteria of the American College of Rheumatology (ACR), as the results of this test would make it possible to compare them with those of similar interventions. The aim of this study is to assess the effects of 2 different programs designed to improve flexibility and reduce the impact of the illness on female FMS patients and to compare their effects in the short and medium term.

Methods

The present longitudinal study is a pilot trial designed to assess 2 physiotherapy treatments based on the improvement of flexibility that can easily be learned and applied by the patients themselves, all of whom were informed of the aim of the study and the techniques involved and gave their written consent to take part.

This study was reviewed and approved by The University of León Ethics Board for human subjects.

Subjects

A total of 20 people who fulfilled the ACR classification criteria for FMS[10] were recruited from the León Fibromyalgia and Chronic Fatigue Association. Patients were screened for entry into the study by a single researcher, who was blinded as to which groups they would be assigned to. All patients were required to be sedentary women aged 18 to 60 years, the only exclusion criteria being other concomitant rheumatic illnesses or any other contraindication preventing them from carrying out any of the components of the treatment program, such as cardiovascular, dermatologic, or neurologic ailments. Patients were assigned randomly; but the small size of the sample meant conditioned risks such as age and pharmacologic treatments (eg, antidepressants, anxiolytics, and hypnotics), leading to a forced comparability of the groups.

Design

The women were assigned to 2 flexibility training groups, one following a program of kinesiotherapy and active muscular stretching (group A) and one using the Mézières techniques of Global Myofascial Physiotherapy[15] (group B), each group directed by a physiotherapist specialized in the treatment of FMS.

Kinesiotherapy. Sessions began with 10 minutes of walking on an H/P/Cosmos pulsar 3p 4.0 walking machine at 3.5 km/h, followed by 35 minutes of exercises on a polyethylene mattress (1000 × 600 × 15 mm), starting from the supine position with the arms stretched alongside the trunk and the legs bent with the soles on the floor, with 10 repetitions of each of the exercises described below:

- Active external rotation of both shoulders, keeping the arms alongside the trunk.
- Alternate flexing of the shoulders, keeping the elbows stretched.
- Simultaneous abduction of the shoulders, with the elbows stretched.
- Alternate flexing of the hips, drawing the knees up to the chest.
- Anteversion and retroversion of the pelvis.
- Circular movements with both shoulders, forming a semicircle on the floor.
- Hugging the bent knees and rocking slowly.
- With the knees bent and the soles together, progressive bilateral abduction of the hips.
- Flexion of the hips, stretching the knees, and dorsal flexion of the ankles, using a 15-cm–wide nonelastic band to aid and maintain the stretch.
- Abdominodiaphragmatic breathing exercises.
- Sessions finished with 15 minutes of progressive relaxation, according to the Jacobson relaxation training method.[16]

The Mézières Method. The sessions started with participants standing for 10 minutes as they carried out abdominodiaphragmatic breathing and warmed up the superficial and deep muscles of the posterior chain from the occiput to the soles of the feet by bending the back slowly while exhaling until pain was felt. The postures chosen for the rest of the treatment, which lasted for 40 minutes, were with the body supine, combined with abdominodiaphragmatic breathing. Two postures were used, one for the suspensor system and the posterior chain (Fig 1) and one designed for treating the brachial chain (the anterointernal musculature of the arms from the palmars to the pectorals) (Figs 2 and 3). Sessions finished with a return to calm consisting of abdominodiaphragmatic exercises with patients lying on their sides and seated for a further 10 minutes before getting up.

Both groups met twice a week for 12 weeks, for a total of 150 minutes each week. One of the weekly sessions consisted of 60 minutes following the program as assigned plus 30 minutes of psychotherapy, whereas the other 60-minute session was of individual physiotherapy, consisting of thermotherapy with paraffin and mud,

Fig 1. *Myofascial stretching of the posterior chain in the dorsal decubitus position.*

Fig 2. *Myofascial stretching of the anterointernal brachial chain, side view.*

relaxing massages of the back, and evacuatory massaging of the abdomen.

Outcome Measures

An initial assessment was made in October (baseline), another as soon as the 12 weeks were over (end of treatment), and a final one 24 weeks after that in July (follow-up), with trained assessors carrying out the same test on all patients each time. The assessors did not know which group subjects belonged to.

Primary Outcome Measures. Illness impact was measured by means of the validated Spanish version of the FIQ questionnaire,[17] one of the most widely used tools in studies of the effects of physiotherapy on FMS[8,9] and consisting of a short 19-item survey designed to assess pain severity,

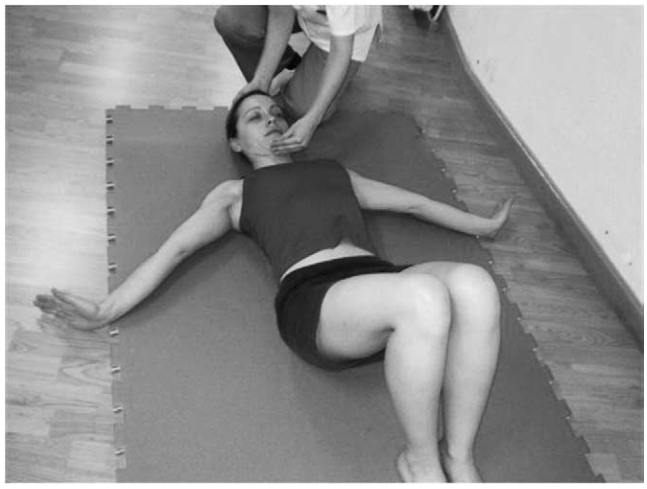

Fig 3. *Myofascial stretching of the anterointernal brachial chain, front view.*

daytime fatigue, morning tiredness, stiffness, anxiety, and depression, as well as the number of days when patients feel good. Scores range from 0 to 80, with higher scores indicating a greater effect of the condition on the patient's life. It has proven to be valid and reliable as well as easy to correlate with the different tests used for assessing the physical condition of FMS patients.[18]

Flexibility of the lower back and hamstrings was measured using a sit-and-reach method.[14] The subject sat on an examination table with legs straight and the soles of the feet resting against a solid board and then bent forward toward the board as far as possible, holding the position for 1 second. Ability to reach the board was scored as 0. The distance from the end of the fingertips to the board or past the board was measured in centimeters and scored as either plus or minus, with plus indicating more flexibility. The validity and reliability of this test with FMS populations have been shown elsewhere.[19]

Secondary Outcome Measures. Pain threshold was assessed by means of the TP count, as pain assessment methods relying on recall might contribute to an apparent improvement in clinical trials.[20] The TPs located in accordance with the ACR[10] classification criteria (ranging from 0 to 18) were counted by a specially trained physiotherapist using a Fisher dolorimeter calibrated for a pressure of 4 kg/cm2. Twelve control points (6 pairs) were also palpated to detect false positives. The TP count has proven useful for detecting changes in the pain threshold of FMS patients on stretching programs[21] and is of recognized validity and reliability for assessing the pain level perceived by FMS patients.[22]

Anxiety was assessed by means of the validated Spanish version of the STAI self-reported scale,[23] which comprises 2 separate scales of 20 items each. The state anxiety scale, used in this study, determines how respondents feel at a certain time and under certain conditions, with the mean score for

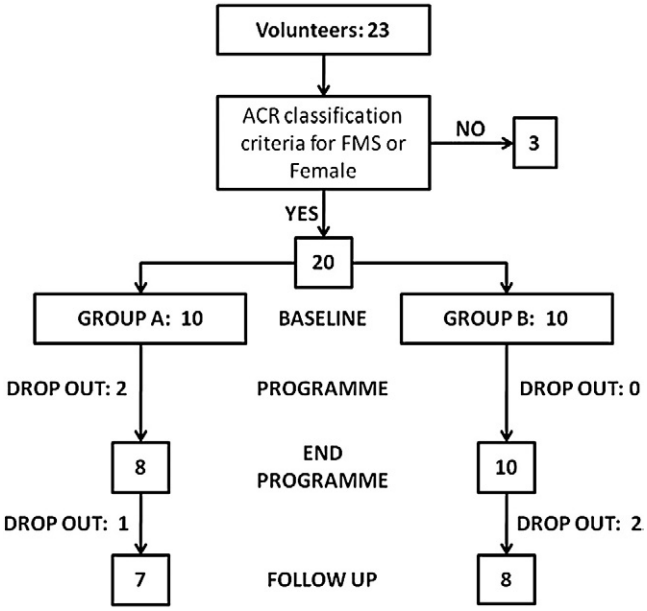

Fig 4. *Flow chart.*

healthy populations being around 20 points. It has proven efficient in clinical trials involving exercise and FMS.[24]

Ancillary Measures. A physiotherapist recorded each patient's case history to collect sociodemographic variables, signs and symptoms of the illness, existence of other health problems, and treatment undergone over the last 6 months (pharmacologic, physiotherapeutic, psychologic, etc).

Statistical Analysis

This was carried out by means of the Epiinfo 6.0 (Centers for Disease Control and Prevention, Atlanta, Ga) and Epidat 3.0 (Xunta de Galicia, Santiago, Spain) programs. For descriptive statistics, the mean was used as the centralizing measure, with standard deviation as the dispersion measure. For the analysis of changes before and after treatment and after follow-up, a variance analysis was made of paired data. The differences between treatments were subjected to a variance analysis after the demonstration of the normality of the distributions by variance contrast with the F^2 test. *P* values less than .05 were considered significant differences. The small size of the sample, 15 subjects, meant working with a low statistical power, whereby only large differences would be detected between treatments or in their effects.

Results

Of a total of 23 volunteers, 20 fulfilled the criteria for inclusion, 5 of whom (3 from group A and 2 from group B) dropped out of the study (2 returned to work and 3 failed during follow-up) (Fig 4).

Table 1. *Characteristics of the patients who completed the study*

	Total	Group A	Group B
n	15	7	8
Age (y)	55 ± 8.4	54.1 ± 8.8	56.4 ± 9.1
Weight (kg)	64.0 ± 10.9	63.0 ± 11.5	64.5 ± 10.3
Height (cm)	154 ± 5.9	155 ± 6.5	153 ± 5.2
Years since diagnosis	7 ± 4.5	7 ± 4.9	7 ± 4.0
Patients on medication (n)	12	6	6
Analgesics	6	2	4
NSAIDs	4	3	1
Muscle relaxants	3	1	2
Anxiolytics	1	0	1
Antidepressants	5	3	2

NSAIDs, Nonsteroidal anti-inflammatory drugs.

A total of 15 participants completed the treatment, with an average age of 55 ± 8.4 years, having been diagnosed as having FM for 7 ± 4.5 years, and with an average number of 14 ± 2.7 TPs. Their characteristics are shown in Table 1.

Despite the fact of having an extremely high rate (around 25%), our results are in agreement with other similar interventions. Sometimes, an FM patient's idea of how a rehabilitation program should be, or how it is going to affect their pathology, is often a wishful thinking; and their expectations are poorly satisfied.

Tender Points

Regarding pain level, Table 2 shows the evolution of the TPs by treatment. There was a general decrease by the end of the program, which disappeared afterward; so the number of TPs was the same at the end of follow-up as when treatment begun. As for the 2 programs, treatment A resulted in a reduction in TPs during treatment, which was recuperated afterward, whereas patients on treatment B showed no increase or decrease in TPs during treatment or follow-up.

Comparing the 2 treatments showed no statistically significant differences regarding the evolution of TPs. There is no established criterion for assessing the clinical repercussions of the increase or decrease in the number of TPs observed.

Flexibility

Table 2 and Figure 5 show the results obtained by treatments in the initial flexibility test, at the end of the program, and after 24 weeks of follow-up. By the end of treatment A, the improvement in patients' flexibility was statistically significant ($P = .007$). After the end of the training program and during follow-up, a loss of flexibility was noted that did not reach statistical significance ($P = .2$). The differences between the initial values and those recorded 24 weeks after the end of the program showed an improvement in flexibility, but this was not statistically significant ($P = .008$).

Patients assigned to treatment B showed a statistically significant improvement in their flexibility ($P = .0007$).

Table 2. *Evolution of the results of the different tests by treatment*

	Values			Differences					
Test	Baseline	End treatment	Follow-up	End treatment − baseline	*P*	Follow-up − end treatment	*P*	Follow-up − baseline	*P*
TPs									
Treatment A	13.3 ± 2.5	10.7 ± 2.2	14.0 ± 3.1	−2.6 ± 2.9	.005	3.3 ± 2.6	.01	0.7 ± 2.9	.5
Treatment B	14.8 ± 2.9	12.5 ± 2.7	13.5 ± 2.7	−2.3 ± 4.0	.15	1.0 ± 6.4	.7	1.3 ± 4.0	.4
Sit and reach									
Treatment A	−2.6 ± 8.2	5.7 ± 4.8	2.8 ± 5.9	8.4 ± 5.6	.007	−2.9 ± 5.1	.2	5.4 ± 6.9	.08
Treatment B	−8.8 ± 6.7	1.1 ± 7.5	−2.2 ± 7.4	9.9 ± 4.9	.0007	−3.3 ± 3.4	.03	6.6 ± 6.0	.02
FIQ									
Treatment A	48.5 ± 10.9	28.0 ± 15.8	56.3 ± 18.9	−20.5 ± 15.3	.01	28.4 ± 16.2	.003	7.9 ± 17.4	.3
Treatment B	49.4 ± 11.6	38.6 ± 8.1	55.5 ± 11.8	−10.8 ± 12.8	.04	16.9 ± 13.5	.009	6.1 ± 17.2	.4
Anxiety									
Treatment A	36.0 ± 14.1	33.3 ± 10.9	33.9 ± 10.5	−2.7 ± 7.4	.4	0.6 ± 11.2	.9	−2.1 ± 18.0	.8
Treatment B	34.0 ± 12.7	30.8 ± 10.5	38.1 ± 11.6	−3.3 ± 10.8	.4	7.7 ± 9.0	.04	4.1 ± 12.6	.4

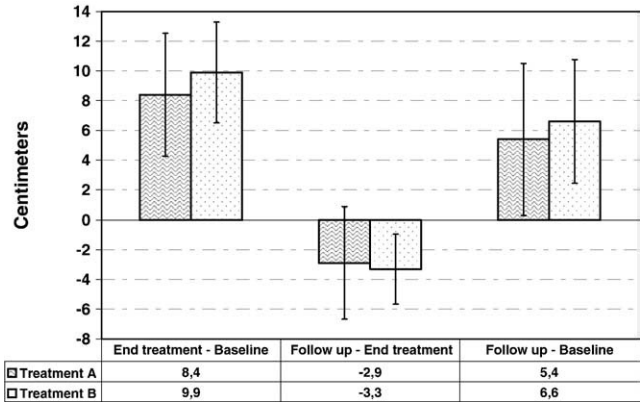

Fig 5. *Differences in flexibility by treatment and 95% confidence intervals.*

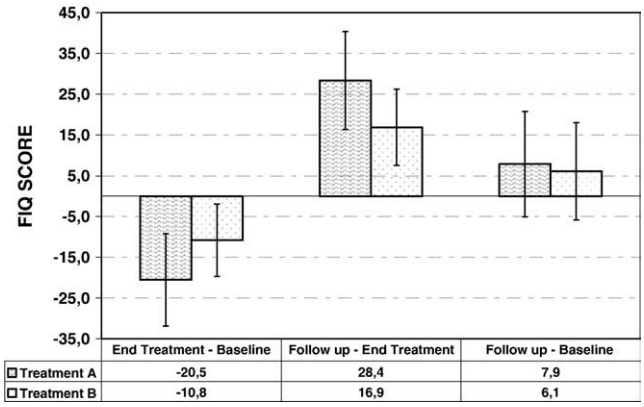

Fig 6. *Differences in FIQ scores by treatment and 95% confidence intervals.*

After the end of the program and during follow-up, a statistically significant loss of flexibility was observed (P = .03), with differences between initial values and those observed 24 weeks after the end of the program showing an improvement that was also statistically significant (P = .02). No statistically significant or nearly significant differences were noticed between the 2 treatments in flexibility at any point during the study.

Impact of the Illness

The FIQ results are shown in Table 2 and Figure 6, where patients are seen to have achieved a statistically significant reduction in the severity of the illness by the end of treatment (A and B). They worsened again, also significantly, when treatment ceased. Differences observed in severity between the beginning of the program and follow-up also show a worsening, but this was not statistically significant.

Treatment A brought a greater reduction (−20.5) from the basal to the final values than treatment B (−10.8), and although the difference was not significant (P = .2), this could have been due to a problem of statistical power caused by the size of the sample. The same may be said for the results.

No changes were observed in the degree of anxiety of the patients by treatment, before and after treatment or during follow-up (Table 2), although significant differences were observed between the global anxiety levels at the end of the treatment and 24 weeks afterward only for treatment A.

No statistically significant differences were observed between the treatments in either the evolution of illness severity (Fig 6) or anxiety levels.

Discussion

This study shows that FMS patients may benefit from different physiotherapy treatments concentrating on the development of flexibility, although the effects disappear when patients abandon treatment.

Initial Level

At the beginning of our study, patients had less flexibility than the general population, which is consistent with the idea that FMS patients have a lower level of functionality than healthy women of the same age.[19] This may be explained by the pain and muscular stiffness typical of the illness, which is often aggravated by physical inactivity and a sedentary life.

Our patients' flexibility was similar to that observed by other authors in FMS patients (−5.7 and −10.5 cm.).[25,26] In comparison with yet other studies, however, ours showed considerably less flexibility[27,28]; and although our sample was older, the differences observed, between 20 and 40 cm, cannot be explained by this fact alone. A possible explanation may be a different general state, whereby our patients scored lower in the FIQ and STAI tests than the younger patients of the other studies in question. In any event, experience shows that, in such patients, flexibility varies enormously, which makes it difficult to compare studies and explain the differences observed.[19]

As for the impact of the illness, the FIQ scores are around 50 points, which indicate a moderately affected QoL.[29]

Effects of Kinesiotherapy on Levels of Flexibility

By the end of our study, patients undergoing kinesiotherapy training had improved their flexibility levels, a circumstance reported elsewhere in the literature. Although several studies have included flexibility exercises for FMS patients in integrated programs and have achieved improvements,[8,9] only in very few studies have subjects been trained exclusively in flexibility; and these have mainly been control groups in studies to assess strength[30] or aerobic exercises.[27,31] Thus, Jones et al[30] observed, as we did, that flexibility improved significantly after a muscle stretching program of 2 weekly 1-hour sessions over 12 weeks. On the other hand, Valim et al,[27] with a 20-week program of 3 weekly 45-minute sessions, observed a tendency to improvement, although it tailed off after the 10th week and overall improvement was not statistically significant.

To avoid overintense training and pain flares, the program designed for our study did not adhere to the guidelines laid down for flexibility improvement by the American College of Medicine and Sport,[32] given the low level of fitness of our sample. Despite this—or perhaps because of it—our results are similar to those of the studies mentioned above. It has been observed before that low-intensity exercises are sufficient to achieve the desired effects in FMS patients,[27,31] which is especially true for groups of unfit people, such as ours.

Effects of the Mézières Method on Flexibility Levels

The group on the Mézières method also improved in flexibility, perhaps because this technique is based on a combination of muscle stretching and posture training, which has been shown to improve flexibility in FMS patients while they also regain muscular strength.[33] These results have also been observed in studies with populations with mobility problems.[34] Furthermore, there might have been a direct link between the work specifically directed at stretching the muscles of the posterior kinetic chain in this technique and a better performance in the sit-and-reach test. On the basis of this, our findings indicate that both therapies, Mézières and kinesiotherapy, are equally efficient in improving flexibility.

Impact of the Illness

By the end of the study, differences of between 10 and 20 points were observed, enough to consider that both treatments lead to an improvement in QoL[28] mainly by means of reducing the impact of FMS. Our hypothesis is that the flexibility training may have had a direct effect on the improvement of some of the most significant symptoms of FMS. Firstly, it should be taken into account that FMS patients apparently perceive pain to be caused by strain, which leads them to avoid any exercise, thus causing more pain.[35] The flexibility training proposed may have minimized muscular pain, breaking the relationship proposed in musculoskeletal conditions such as FMS, where depression, pain, and disability lead to a cycle of poor mental and physical health.[36] Therefore, our patients may have lost their fear of exercise and led a more active life, thereby to some extent reducing their fatigue levels. The physiotherapy may also have improved the quality of their sleep, as mentioned in similar studies.[31,37] It should also be pointed out that participation in a flexibility program has led to improved sleep in patients with chronic pain.[38] Here it should be stressed that the physiotherapy treatments used in our study included relaxation and stress reduction, which must have helped reduce the impact of the illness.[39] Finally, it should be said that the cognitive behavioral component of flexibility training may have a significant treatment effect because the benefits of exercise in FMS are enhanced when combined with targeted self-management education.[40]

Other authors have proposed similar stretching programs and have failed to observe an improvement in patients' QoL, despite improved flexibility,[41] which would seem to indicate that the physiotherapy and psychotherapy treatments aiding the flexibility training programs may also be related with the improvement in disease severity in our patients. Exercise combined with other therapies is known to improve QoL. Even belonging to a therapy group for a time can lead to improvement,[39] which might be especially true for an illness such as FMS because most patients seem to have some kind of psychosocial stress,[42] which may be attenuated by means of such collective therapies. That being the case, our combined therapy could reduce or, at least, somehow soften this stress, resulting in a better QoL. Quality of life of patients with FMS is altered by the presence of symptoms such as somatization, depression, and posttraumatic stress disorder[43]; so the inclusion of techniques of relaxation and

stress reduction might somehow help reduce the impact of the illness.

We failed to observe influence of our program on anxiety level, which is not uncommon. There are several explanations for this.[24] On one hand, it is difficult to alleviate anxiety when there is pain or fatigue, whereas on the other hand, among patients who have had the symptoms for a longer period, as in our sample; response to treatment is usually less favorable. Moreover, the link between exercise and psychomental changes is complex and more difficult to detect than, for example, physical changes. It should also be pointed out that the sessions were not very frequent and that the effect of exercise on state of mind depends on frequency.[44]

On the other hand, functional MRI studies have revealed alterations in the functioning of the brain in FM patients as compared with healthy individuals.[45] Such symptoms as widespread pain would therefore suggest a central nervous system–processing problem. Other findings, like metabolic alterations in the brain's pain-processing regions or baseline levels reflecting abnormal neural activity, specifically in the caudate nucleus,[46] give force to the idea that rehabilitation therapies should include the teaching of self-administered strategies for regulating and controlling pain.

Pain

Regarding pain, it should be pointed out that assessing the efficacy of FMS treatments by the decrease in the number of TPs is fraught with controversy. Some physical activity programs, despite their comprehensiveness, have been unsuccessful in reducing their number, whereas others have led to inconclusive results. Martín et al,[41] for example, achieved a significant reduction in TPs in a group of patients who took physical exercise, but not in those prescribed relaxation. Valim et al[27] observed a drop from 16 to 11 TPs, although only in a group doing aerobic exercises, whereas the group on flexibility training hardly showed any change. Bennet et al,[28] however, managed to bring TPs to less than 11 in 70% of the patients in an aerobic program that included stretching. Although exercise can benefit chronic painful conditions through several mechanisms such as increasing the level of β-endorphin or promoting a decrease in sympathetic activity,[27,31] this is achieved with aerobics and not with flexibility training; so other hypotheses are needed to explain the raising of the pain threshold in patients on kinesiotherapy. It may be because stretching is often recommended for patients with pain, as their muscles are often tense and stiff. The aim is to reduce tension and to increase blood circulation, which is expected to indirectly reduce pain. Because of this, many FMS patients find gentle stretching useful for pain relief in the short term.[44] As for the patients on the Mézières method, the tendency toward a decrease in TPs may be due to many TPs coinciding with trigger points of the posterior myofascial chain, the specific target of this technique. Increased muscle flexibility and vascularization, along with enhanced contractibility of the muscle chains treated, would avoid overburdening the muscles and bring down pain perception. More research is needed on this point.

Finally, it should be stressed that some studies indicate that the TP count might serve as a marker for the severity of neuropathic pain rather than for stress or somatization.[43] This would mean that, although the treatment might be effective in reducing such symptoms, improvement in the pain level would not be reflected in TP counts. Moreover, FMS patients may show a positive treatment effect as noted by an overall improvement in their algometry measurements, but still have the same total number of TPs upon examination.[25] Therefore, a myalgic score that sums or averages the intensity ratings for TPs might have been more sensitive because such an approach would have yielded changes in pain level after physiotherapy.[47]

Adherence

Our results show a dropout rate of around 25%, in agreement with most findings.[21] This could be due to a number of factors, such as failure of the program to meet early expectations, increased pain, or the existence of a substantial difference between meeting a group's request and meeting individual expectations.

Follow-Up

In our study, after treatment, a tendency to return to initial levels was noticed, although at 24 weeks after treatment completion, some improvement was still retained. This has been noticed by other authors: only in cases where the training or activity recommended was kept up over time did the beneficial effects last, in both overall fitness and in flexibility.[25] In our case, flexibility, alongside with aerobic capacity and muscular strength, is one of the aspects of fitness that are most severely impaired by inactivity,[19] with FMS patients frequently giving up the exercises, especially stretching, at the end of the program.[48] In the case of the Mézières technique, the need for a professional to guide and help the process may lead to patients abandoning activities when programs end. For this reason, our findings are like those of other studies that have shown that a physiotherapy program may have a positive impact on several symptoms of FMS in the short term, but not necessarily in the long term.[49]

Lastly, when interpreting our results, the beneficial effects of the relaxation exercises, and massotherapy mud and paraffin treatment, already observed by other authors,[50] should be taken into account. Indeed, as other authors have pointed out,[25,28] the psychopathologic characteristics of the illness and the possibility of any simple intervention—whether physical or cognitive—that helped patients understand and bear their illness better would bring on such an improvement more than the effects of the physical exercise

itself. In this regard, other authors have suggested the possible value of a multidisciplinary treatment program, including cognitive behavioral therapy and psychoeducational classes, along with exercise and massage, in alleviating the physical and psychologic symptoms of FMS.[51]

The small sample size—together with the lack of adequate statistical power, confounding variables, and the large dropout rate of our study—means that our results should be considered with caution. This study shows the need for longer longitudinal studies with larger samples comparing interventions based on multidisciplinary therapies including physical exercise and cognitive behavioral therapy with similar ones, but including stimulus strategies, to assess their efficiency and the effects of following them.

Practical Applications

- Women with FMS can take advantage of kinesitherapy and active muscular stretching techniques.
- Global Myofascial Physiotherapy, according to the Mézières method, was a useful tool in the rehabilitation process of women in this study.
- Physiotherapy programs specifically based on flexibility training may improve FMS women's QoL by means of reducing the impact of the disease.

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