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Primary Care Physical Therapy in People With Fibromyalgia: Opportunities and Boundaries Within a Monodisciplinary Setting

Jo Nijs, Kaisa Mannerkorpi, Filip Descheemaeker, Boudewijn Van Houdenhove

Despite the fact that people with fibromyalgia syndrome (FMS) frequently are seen by primary care physical therapists, guidelines for the management of FMS are based primarily on outcomes from multidisciplinary and tertiary care treatment studies. Few data addressing the treatment of patients with FMS in primary care currently are available. The evidence-based guidelines on the management of FMS are based, in part, on evidence from studies examining physical therapy treatment components alone (eg, aerobic exercise, education). Thus, the recommendations can be applied to primary care physical therapy. Primary care physical therapy for patients with FMS should include education, aerobic exercise, and strengthening exercise. For other treatment components such as passive treatments, activity management, and relaxation, less evidence currently is available to advocate their use in primary care physical therapy. Superior results are to be expected when various treatment components are combined.
Primary Care Physical Therapy in People With Fibromyalgia

The American College of Rheumatology defines fibromyalgia syndrome (FMS) as a syndrome characterized by chronic widespread pain and tenderness in at least 11 of 18 predefined tender points.1 Population-based studies suggest prevalence rates between 0.5% to 6%.2,3 Fibromyalgia syndrome shows high comorbidity with other disorders, particularly chronic fatigue syndrome and mental disorders, including depression and anxiety disorders.4 Indeed, FMS is not only a chronic pain syndrome but also consists of a whole range of symptoms referring to effort intolerance and stress intolerance, as well as hypersensitivity for pain and other sensory stimuli.4,5 Fibromyalgia syndrome can be strongly incapacitating and is associated with high direct and indirect medical costs.5,6 The precise etiology and pathogenesis of FMS remain undefined, and there is no definite cure.5 Current treatments range from pharmacological to psychological/behavioral interventions, aerobic exercise, and alternative treatments such as balneotherapy.6

Over recent years, there has been a dramatic increase in the number of studies and reviews concerning the efficacy and effectiveness of pharmacological and nonpharmacological (mono-component and multicomponent) treatments for FMS,6–16 which renders it difficult for both researchers and clinicians to keep abreast of these evolutions. In addition, the majority of the treatment studies published in the area of FMS address multidisciplinary treatments or tertiary care settings. Few data addressing the treatment of patients with FMS in primary care currently are available. Despite this paucity of data, however, in many Western countries, people with fibromyalgia are frequently seen in primary care. A qualitative study revealed that 10 of 12 patients with FMS were offered physical therapy.17 In Spain, non-drug therapies accounted for the largest proportion of the health care costs of those diagnosed with FMS.18 Some patients need to drive more than an hour to attend a specialized chronic pain or fibromyalgia clinic. This situation applies to primary care physical therapy as well: many primary care physical therapists around the world work with patients with FMS in a monodisciplinary setting. However, it remains unclear how the findings from multidisciplinary studies and guidelines for multidisciplinary management of FMS can be translated to a monodisciplinary setting. Likewise, it remains unclear how primary care physical therapists can apply research data gathered in tertiary care settings. Furthermore, because most randomized controlled trials are based on group formats, it could be assumed—in line with findings in chronic fatigue syndrome19—that individual treatments may be more effective. Indeed, some trials on individual therapy in FMS have demonstrated substantial effects that were sustained over time.7,8

For the reasons outlined above, our aim is to provide an overview of our current understanding of FMS from a primary care physical therapy perspective. The evidence-based guidelines on the management of FMS are based, in part, on evidence from studies examining physical therapy treatment components alone (eg, aerobic exercise, education).15,15,20–22 Thus, the evidence-based recommendations can be applied to primary care physical therapy. This article extends our previously published practical guidelines for the use of manual therapy in the treatment of patients at risk for developing chronic widespread pain or with established FMS,23 which were focused on the manual therapy profession. It is not our intention to advocate that physical therapists are able to manage a complex disorder such as fibromyalgia on their own. Rather, it is our intention to explain: (1) what primary care physical therapists should know about the illness known as FMS, (2) how they can contribute to the management of FMS, (3) how they potentially can share the workload with other health care providers such as psychologists and occupational therapists, and (4) the boundaries of their profession in relation to the management of FMS.

Understanding FMS From a Physical Therapy Perspective

Fibromyalgia syndrome is a complex disorder with undefined etiology and pathogenesis. A body of scientific literature reporting anomalies in various body systems, including the endocrine, immune, somatosensory nervous, autonomic nervous, and musculoskeletal systems, currently is available. However, conflicting data among studies precludes drawing firm conclusions regarding the pathophysiological mechanisms of FMS. Here we summarize the sole feature of FMS pathophysiology that is no longer in debate (ie, central sensitization) and link it to other aspects of the illness that are of importance to physical therapist practice. Fibromyalgia syndrome is characterized by sensitization of the central nervous system, which explains the majority of, if not all, symptoms. Central sensitization is defined as an augmentation of responsiveness of central neurons to input from unimodal and polymodal receptors.24

Central sensitization encompasses
altered sensory processing in the brain, malfunctioning of descending antinociceptive mechanisms, increased activity of pain facilitatory pathways, temporal summation of second pain or wind-up, and long-term potentiation of neuronal synapses in several brain areas, including the anterior cingulate cortex. Besides top-down mechanisms included in the pathophysiology of central sensitization, it is important to realize that there are bottom-up mechanisms as well: repetitive musculoskeletal injuries and traumas may provide a sufficient amount of nociceptive barrage toward the central nervous system. Once central sensitization is established, little nociceptive input is required to maintain it. The outcome of the processes involved in central sensitization is an increased responsiveness to a variety of peripheral stimuli, including mechanical pressure, chemical substances, light, sound, cold, heat, and electrical stimuli. The increased sensitivity to various stimuli results in a large decreased load tolerance of the senses and the neuromusculoskeletal system.

The relationship between pain facilitation and pain inhibition is influenced by cognitions, emotions, and behaviors such as catastrophizing, hypervigilance, avoidance behavior, and somatization. In cases of more intense pain levels, pain catastrophizing is associated with decreased activity in brain regions involved in top-down pain suppression such as the dorsolateral prefrontal cortex and the medial prefrontal cortex. In addition to catastrophizing, avoidance behavior and somatization may result in sensitization of the dorsal horn spinal cord or, alternatively, may be the result of central sensitization.

Another feature of FMS pathophysiology repeatedly demonstrated is the dysregulation of the stress response system, notably the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system. HPA-axis hypofunction predicted the development of chronic widespread pain in a group of psychologically “at-risk” patients. In line with the patients’ history, this abnormal functioning of the stress system seems to occur mostly in the aftermath of a long period of overburdening by physical and emotional stressors and to be precipitated by an additional trigger in the form of an acute physical or emotional event. The stress system is capable of influencing pain processing via dorsal horn glucocorticoid receptors (receptors having pain inhibitory capacity) and GABA (γ-aminobutyric acid) neurotransmission.

Treatment of central sensitization in patients with FMS might be possible by attempting to activate top-down pain inhibitory pathways through brain neurotransmission (eg, noradrenergic/serotonergic reuptake inhibitors). Alternatively, one may tackle those factors known to influence central sensitization, including the stress response system, cognition, emotions, tissue-specific factors, and so on. Here we explain how physical therapy aimed at desensitizing the central nervous system can be applied to patients with FMS.

**Primary Care Physical Therapy for Patients With FMS**

**Education**

The diagnosis of FMS often results in confusion and increased uncertainty among patients. To decrease uncertainty, patients search for information and develop or adjust illness beliefs. An acceptable explanation for symptoms experienced by the patient is required to accept the fact that they have a debilitating illness. However, many patients with FMS have maladaptive illness beliefs, cognition, and behaviors that preclude successful rehabilitation. Poor understanding of pain may lead to the acquisition of maladaptive attitudes and behavior in relation to pain. Lack of knowledge or disagreement regarding pain etiology is predictive for maladaptive cognition about pain and greater affective distress. Furthermore, it is known that more adequate pain beliefs lead to increased confidence, which, in turn, leads to increased activity levels. Thus, patients with FMS must develop a degree of knowledge before they can learn how to cope with their illness.

In general, patient education alone is recommended by various evidence-based guidelines for the management of FMS (eg, level II evidence according to the American Pain Society, meaning that its use is supported by well-designed experimental studies). These recommendations are applicable to primary care physical therapy: pain neurophysiology education was found to be effective in reducing pain catastrophizing in patients with chronic (widespread) pain. An educational course directed at improving self-efficacy for the management of the pain disorder ameliorated symptom severity and improved physical function. Several effects lasted during 24 months. In that program, education of pain management through modification of lifestyle was combined with interactive discussions and supervised exercise in a group. If pain cognition can be changed by educating patients, increased exposure to activity is allowed, leading to increased performance. Besides educating patients with FMS about the nature of their symptoms and illness, education often is used to introduce and implement various other treatment options such as activity management, stress management, and exercise therapy.
Activity Management

Patients with FMS must learn to cope with their illness, which often requires significant and permanent lifestyle changes, including activity self-management. Evidence in support of activity management alone for those with FMS is currently unavailable. However, it is generally included in cognitive behavioral therapy, a treatment advocated by various evidence-based guidelines for FMS (eg, level I evidence according to the American Pain Society, implying that its use is supported by a meta-analysis of multiple well-designed controlled studies). Within a multidisciplinary setting, it seems reasonable to advocate that occupational therapists should provide activity management to patients with FMS. However, physical therapists are trained to provide activity management as well. Further study is needed to examine whether primary care physical therapists are able to provide activity management to patients with FMS successfully.

Activity management for patients with FMS includes teaching them to manage daily activities in accordance with their decreased load tolerance. This way, the deregulated stress response system will be less tested and thus might be able to recover. In addition, teaching people with FMS to cope with all kinds of physical activity diminishes bottom-up nociceptive input, which is known to maintain the process of central sensitization.

The use of activity self-management together with, or prior to, exercise therapy appears warranted for people with FMS. Self-management for people with FMS involves encouraging patients to pace their activities and respect their physical and mental limitations. This strategy involves encouraging the patient to achieve an appropriate balance between activity and rest in order to avoid exacerbating symptoms. It requires the patient to set realistic activity goals on a daily basis and to regularly monitor and manipulate activity in terms of intensity, duration, and rest periods in order to avoid overexertion, which can result in worsening symptoms (and bottom-up nociceptive input).

Passive Treatments

Trigger point injections, joint manipulation, and myofascial release techniques are among the more commonly used modalities in the management of FMS. Limited evidence supports the use of spinal manipulation and moderate evidence supports the use of massage therapy in patients with FMS (level II evidence according to the American Pain Society). These types of treatment can be applied in primary care physical therapy settings. In cases of hypersensitivity of central pain pathways, relatively minor injuries or trauma at any location are likely to sustain the process of central sensitization. In these patients, local musculoskeletal problems are more than epiphenomena and can serve as continuous sources of afferent painful barrage that fuels central sensitization. Passive treatments are unlikely to cure FMS, but can still resolve the localized musculoskeletal pain problem and thus decrease afferent painful barrage.

Transcutaneous electric nerve stimulation (TENS) frequently is used in patients with chronic pain and can be used by primary care physical therapists. Transcutaneous electric nerve stimulation primarily activates segmental and polysegmental inhibitory circuits by activating spinal μ- and δ-opioid receptors. Although modest treatment responses to TENS have been reported in patients with FMS, widespread and poorly localized chronic pain states are less likely to be suitable for treatment with TENS. Joint mobilization is able to activate descending (top-down) pain inhibitory mechanisms and thus to desensitize the central nervous system for a short period of time (30 – 45 minutes). However, primary care physical therapists administering passive treatments to patients with FMS should take into account that any therapeutic intervention triggering more pain will serve as a new peripheral source of nociceptive barrage and thus will sustain the process of central sensitization. This was evidenced by a study of patients with FMS showing that altered central pain processing was further augmented by isometric exercise. Likewise, treatments triggering more pain serve as a physical stressor attacking the already deregulated stress response system, thereby initiating a vicious cycle. Practical guidelines for the use of manual therapy in the treatment of patients with FMS have been presented elsewhere. Still, passive treatments should not be the core feature of FMS treatment, and it should be acknowledged that their use might confirm maladaptive illness beliefs (eg, FMS is a muscle disease) and coping strategies (eg, “you fix me”).

Stress Management/Relaxation

Evidence in support of the use of stress management or relaxation alone, applied by primary care physical therapists, is unavailable. However, it is generally included in cognitive-behavioral therapy, a treatment advocated by various evidence-based guidelines for FMS. In addition, biofeedback often is used to teach stress management techniques to patients with FMS. The American Pain Society indicates that the use of biofeedback for FMS is supported by level II evidence. Stress management or relaxation generally is included in physical therapy curricula around the world, and it can easily be applied in a primary care physical therapy
setting. In selected complex cases (eg, with involvement of severe personality problems), referral to a clinical psychologist or a psychiatrist may be warranted.

In line with our current understanding of FMS pathophysiology as described above, we formulated a working hypothesis for the management of FMS in terms of a stress system deregulation leading to pain hypersensitivity and effort intolerance, the recovery of which may be facilitated by the use of sustained lifestyle adjustment and life goal adjustment.\textsuperscript{4}\textsuperscript{–}\textsuperscript{5}\textsuperscript{6} This hypothesis implies defining stress tolerance improvement as an important treatment goal for patients with FMS. Improving stress tolerance can be achieved by identifying individual stressors during daily life and in-depth explanation of how stress can interfere with their illness (awareness phase), followed by concrete action (action phase). During the awareness phase, patients become aware of the various sources of stress interfering with their daily life. The identified stressors are combat during the action phase, during which patients are taught to set realistic goals for stress improvement, how to apply stress management techniques (eg, relaxation training) during daily life, and how to avoid self-generated stressors (eg, by being too perfectionistic or setting unrealistic life goals).

**Exercise Therapy**

Strong evidence supports aerobic exercise (eg, level I evidence according to the American Pain Society), and moderate evidence supports muscle strength training for the management of FMS.\textsuperscript{20}\textsuperscript{–}\textsuperscript{22} Likewise, the Ottawa Panel evidence-based clinical practice guidelines for the management of FMS recommend both aerobic exercises and strengthening exercises as a result of the emerging evidence in the literature.\textsuperscript{15}\textsuperscript{–}\textsuperscript{16} Importantly, the Ottawa Panel guidelines are based on studies that implemented only aerobic exercise and studies that incorporated a diversity of interventions. Aerobic exercise alone is effective for improving quality of life in patients with FMS,\textsuperscript{15} implying that it can easily be used by primary care physical therapists. This conclusion applies to strengthening exercise as well.

Poor physical fitness is common among patients with FMS, and the main reason for reduced fitness is thought to be their lowered overall activity level. Physical exercise is troublesome for many patients with FMS due to activity-induced pain, especially for patients with severe disabilities. A recent study of pool exercise indicated that patients with milder symptoms appear to receive the best effects of exercise.\textsuperscript{57} However, most patients with FMS feel that exercise is important for their health, well-being, and peacefulness, despite pain.\textsuperscript{58}

Exercise therapy may have several goals, depending on the patient’s pain, body functions, motivation, and preferences. A realistic goal for a patient with severe pain, distress, and disabilities is to increase the overall activity level and the tolerance to exercise, whereas a goal for a patient with milder symptoms might be to increase muscle strength (force-generating capacity) or cardiovascular fitness. Enhanced well-being can be included in the goals for all patients.

Patients with severe pain and distress, often presented together with severe activity limitations, should start exercise at a low intensity level that they perceive as comfortable. Activity management, as explained above, will prepare the patient for exercise therapy. The main goal of exercise therapy is improving exercise tolerance. This goal can be accomplished by motivating the patient to exercise on a regular basis, despite pain. The exercise intensity should be progressed according to the patient’s limitations and resources. A feasible mode is low- to moderate-intensity exercise in a temperate pool, as it off-loads the body weight and alleviates stiffness and pain. Exercise can be performed in a group, which provides an opportunity for social interaction and support. Pool exercise has been shown to reduce pain and to improve health status, walking capacity, and well-being.\textsuperscript{10}

Walking at self-selected intensity and duration is feasible for most patients. Those who cannot manage walking for a longer duration can divide their daily walks into 2 shorter sessions. Walking has been found to enhance body function and reduce symptom severity in sedentary patients with FMS.\textsuperscript{10}

Patients with milder pain may be able to start exercise at moderate intensity, with individual progression of exercise intensity. Studies have shown that patients who can follow aerobic exercise prescriptions defined for individuals who are healthy improve their physical capacity.\textsuperscript{59} Strength training starting at low loads and progressing to 60\% to 80\% of the maximum voluntary contraction has been shown to improve muscle strength.\textsuperscript{59}

As activity-induced pain is common in patients with FMS, it should be acknowledged and discussed with patients starting exercise to prepare them for pain alleviation that they can perform at home, such as warm baths, stretching, relaxation, and so on. If disabling pain lasts for several days, it is wise to decrease the exercise intensity or duration, but to follow the planned frequency of exercise. Patients with generalized pain can present local pain conditions (eg, tendinitis, trochanteritis, osteoarthritis, signs of cardiovascular
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disease), which may become a hindrance for exercise. In these cases, the physical therapist should consider an individual treatment of the condition or contact the referring physician to obtain pharmacological treatment.

Nonspecific Factors
Nonspecific factors such as the patient’s emotional processing of the encounter with the health care professional, the quality of the therapeutic alliance, and the patient’s treatment preferences may be important in predicting therapeutic outcome. In this context, patient-clinician concordance versus discordance has been found to be an important predictor of treatment adherence in FMS. In one FMS study, a distinction was observed between patients’ satisfaction with improvement and their satisfaction with the care provided, the latter being related to greater adherence and more pain relief.

These findings illustrate the need for empathic understanding from the clinician, which may counteract large differences between patients’ expectations and those offered by health care professionals, leading to a “negative mind-set.” Primary care physical therapists can overcome this issue by explaining their treatment program in detail and by addressing patients’ questions and potential objections.

In the same context, a subgroup of patients with FMS report a history of early adversity, in particular, emotional, physical, and sexual maltreatment or abuse. This subgroup may have particular psychosocial characteristics, such as personality disorders that may have important implications for the therapeutic encounter. In some of these cases, contact with the referring physician will be necessary to consider pharmacological therapy or to obtain psychiatric advice. Finally, studies that systematically manipulate nonspecific therapeutic factors are needed, for example, by comparing group treatment approaches with individual therapy, the latter implying more intense and personalized patient-therapist contact.

Discussion and Conclusion
Despite the fact that people with FMS frequently are seen by primary care physical therapists, the majority of the treatment studies published in the area of FMS address multidisciplinary treatments or tertiary care settings. Few data addressing the treatment of patients with FMS in primary care are currently available. Still, the evidence-based guidelines on the management of FMS are based, in part, on evidence from studies examining physical therapy treatment components alone (eg, aerobic exercise, education). Thus, evidence-based recommendations can be applied to primary care physical therapy. We conclude that primary care physical therapy for patients with FMS should include education, aerobic exercise, and strengthening exercises. For other treatment components such as passive treatments, activity management, and relaxation, less evidence is currently available to advocate their use in primary care physical therapy. It should be stated that superior results are to be expected when various treatment components are combined (multicomponent treatment, such as when aerobic exercise, antidepressants, education, and cognitive-behavioral therapy are combined).

Thus, primary care physical therapists should combine various treatment components themselves (eg, education, aerobic exercise), and work with the treating physician and, if possible, a psychologist.

Fibromyalgia syndrome is characterized by hypersensitivity of the central nervous system (central sensitization), which is closely related to the deregulated HPA-axis and sympathetic nervous system. Physical therapists can use education to improve pain cognition, activity self-management, and passive treatments such as manual therapy to decrease bottom-up nociceptive input, stress management, and relaxation to improve stress tolerance and exercise therapy to increase load tolerance. However, physical therapists should not be addressing some of the psychosocial components (eg, cognition, emotions) directly unless they have had some training in psychosocially oriented pain management, preferably in a multidisciplinary center. Adequate skills development is required before embarking on the treatment of patients with FMS in primary care.

It has been advocated that exercise therapy might be able to reactivate descending nociceptive inhibitory pathways in patients with FMS, but supporting evidence is lacking. Studies exploring the potential of primary care physical therapy for the management of FMS, including the role of nonspecific therapeutic factors, are warranted.

All authors provided concept/idea/project design and writing. Dr Mannerkorpi provided data collection and analysis.

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