

Healthy lifestyle interventions in general practice: Part 16: Lifestyle and fibromyalgia

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Abstract

Fibromyalgia is a chronic disorder, characterised by chronic widespread musculoskeletal pain, and the presence of multiple tender points as well as a host of associated symptomatology. Optimal management of patients with fibromyalgia requires a multidisciplinary approach, with a combination of pharmacological and non-pharmacological interventions that are tailored to the patient's pain, dysfunction and associated features, including depression, sleep disorder and fatigue. Non-pharmacological lifestyle-based interventions to treat this disorder include exercise therapy, dietary modification, and psychosocial interventions. This review outlines these three forms of lifestyle intervention in patients with fibromyalgia.

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Introduction

This article forms the sixteenth part, and constitutes the final paper, in the series on the role of lifestyle modification in general practice, with specific reference to patients living with fibromyalgia.

Fibromyalgia is a chronic disorder (> 3 months) of unknown aetiology, characterised by chronic widespread musculoskeletal pain, and the presence of multiple tender points at 11 of 18 specified sites on physical examination.¹ Associated features include chronic fatigue, sleep disturbance, mood disturbance, headache, bowel and bladder dysfunction, disturbed balance, paresthesias and other symptomatology.

Alteration in the physiological pain-processing mechanisms, resulting in loss of pain regulation and pain amplification, as well as complex interactions with psychological and environmental factors, are thought to contribute to the development and maintenance of fibromyalgia.²

The prevalence of fibromyalgia is estimated to be between two and three per cent in the USA. Among women, it is the third most common rheumatic disorder after low back pain and osteoarthritis, and affects about five per cent of all women.³ However, the incidence and prevalence of fibromyalgia in South Africa is not known.

Globally, there are few data regarding fibromyalgia costs. In a Canadian study, patients with fibromyalgia used about twice the health services, and incurred about twice the costs, as a control group.⁴ A further study, conducted in the USA, calculated total healthcare costs to be three times higher in patients with fibromyalgia, compared to a control group.⁵

Sicras-Mainar et al calculated incremental costs resulting from the use of healthcare and non-healthcare resources by patients with fibromyalgia, compared to a reference group in a European primary care setting.⁶ The mean incremental cost in patients with fibromyalgia exceeded costs in the reference group by more than €5 000 per year, and also displayed a higher prevalence of co-morbidities, used more pain-related medication, and had a higher rate of sick leave than the reference population.

Optimal management of patients with fibromyalgia requires a multidisciplinary approach, with a combination of pharmacological and non-pharmacological interventions that are tailored to the patients' pain, dysfunction and associated features, including depression, sleep disorder and fatigue.⁷ Pharmacological agents used in the management of fibromyalgia include analgesics, such as paracetamol, tramadol or pregabalin, which have shown to reduce pain.⁷

Antidepressant agents, such as amitriptyline, fluoxetine or duloxetine, also reduce pain and often improve function.⁷ However, pharmacological management of this condition is beyond the scope of this article. Non-pharmacological lifestyle-based interventions to treat this disorder include exercise therapy, dietary modification, and psychosocial interventions. This review will focus on these three forms of lifestyle intervention in patients with fibromyalgia.

Physical exercise

A number of recent reviews have evaluated the effects of exercise training on patients with fibromyalgia.⁷⁻¹² These reviews have concluded that, to date, conducted studies have generally shown that exercise training has a positive effect on patients with fibromyalgia. However, many of the studies included in the reviews include small patient numbers, and this finding hampers detailed interpretation of various types of exercise interventions. However, it is clear that exercise training plays an important role in management of the patient. In summary, the reviews indicate the following exercise training benefits for patients with fibromyalgia.

Moderate intensity aerobic exercise training for a 12-week period may improve overall well-being and functional capacity in patients with fibromyalgia. However, it seems that this form of exercise training results in little, or no difference in pain and tender points.^{10,11} Strength training for a 12-week period is effective in this regard, and leads to an improvement in overall well-being and depression. However, this form of training may not result in a difference to the patient's functional capacity.^{10,13}

Moderate aerobic, or resistance exercise training, in patients with fibromyalgia is more effective than flexibility training alone, or relaxation exercises alone, in improving health outcomes, including tender point count and scores on the fibromyalgia impact questionnaire (FIQ). Exercise training, together with a simultaneous education programme, leads to better patient control of fibromyalgia-associated symptoms.

Exercise training studies, included in these reviews, showed that exercise was safe for most patients. However, it seems that there is a narrow therapeutic window in patients with fibromyalgia, with too mild an exercise stimulus failing to yield benefits, while over-vigorous exercise seems to exacerbate symptoms.^{10,14}

Exercise training may also have the following specific physiological benefits for patients with fibromyalgia:

- Improved joint range of motion, increase in cardiovascular function, muscle strength and endurance capacity.

- Improved body composition, sleep, quality of life, self-efficacy (mastery), improved fitness, and functional capacity with respect to daily living activities.¹⁵
- Moderate aerobic and strength training have been shown to improve depression in individuals with clinical depression, and can improve sleep in individuals with sleep disorders.
- Resistance training has shown to improve heart rate variability, and attenuate the autonomic dysfunction that might occur in patients with fibromyalgia.¹⁶
- Flexibility training programmes, combined with other types of exercise programmes, improve the symptoms of patients with fibromyalgia.
- Fibromyalgia is associated with impaired balance and increased fall frequency.¹⁷ Exercise training in the form of strength and postural training, may lead to reduced chances of falling and musculoskeletal injury.
- Other benefits of regular physical activity include a reduction in other risk factors for chronic cardiac disease, including hypertension, hyperlipidaemia, obesity and diabetes.^{15,18}

Practical considerations in prescribing exercise

Patients with fibromyalgia are typically very deconditioned, and may only tolerate low-level submaximal exercise testing. Gluteal tender points might limit cycle testing, and training. The six-minute walk test is a useful measure of functional capacity in these patients.

Exercise training should be individualised, and start at a low intensity level. Based on the patient's tolerance to exercise-induced pain, it should gradually increase in intensity. Programmes should aim at achieving moderate exercise intensity.¹⁹ Strength-training programmes should begin with much lower resistance than age-predicted norms, and due to poor tolerance of eccentric muscle contraction, this form of resistance training should be minimised.

In most studies, the initial exercise prescription for patients with fibromyalgia is conducted exercise training for at least 20 minutes once a day, or for 10 minutes twice a day, two to three days a week. Strength training in these studies was conducted two to three times a week, with at least eight to 12 repetitions per exercise. Typically, exercise programmes last between four and 24 weeks.¹⁷

Patients should be encouraged to complete a daily questionnaire recording symptoms (FIQ, for example). The intensity and duration of exercise should be adapted based on the exacerbation of post-exercise pain, fatigue, and other symptoms. If exercise training leads to increased symptoms, the intensity of the programme should be reduced until symptoms improve.

Patients with fibromyalgia beginning an exercise training programme should be informed that they may experience a temporary increase in pain and fatigue. However, if they continue exercising at the appropriate intensity, these symptoms should return to baseline levels within the first four weeks of exercise.

Water-based exercise training has also shown improved psychological well-being and quality of life in patients with fibromyalgia. Although there are no additional benefits of water-based exercise, over land-based exercise, with respect to improved functional capacity and reduced pain, the former might have greater benefits with respect to mood and sleep quality, compared to the latter.^{9,14,20-22}

Mind-body forms of exercise, such as tai chi, yoga and pilates, may be particularly beneficial to patients with fibromyalgia.^{11,23}

A common problem in many of the studies on exercise training in patients with fibromyalgia seems to be the high rate of attrition, particularly with respect to female patients. Higher disability and symptomatology at baseline evaluation, and increased barriers to exercise during treatment, predicts poor exercise compliance. Avoidance of early morning exercise due to morning stiffness, repetitive overhead exercise, excessive workloads, and high-intensity exercise, is important for patients with fibromyalgia, and might help minimise attrition. Patient education and participation in psychosocial interventions, including those mentioned in this article, could teach patients to limit barriers to exercise participation.²⁴

Psychosocial interventions

Of all the chronic pain conditions, fibromyalgia remains one of the most challenging to manage. An emerging understanding of the pathophysiology [central augmentation of sensory input, abnormalities in descending pain inhibition pathways, and dysregulation in the stress axes (both hypothalamic-pituitary-adrenal and autonomic)], is offering insight into the condition. However, this has not translated into inevitable therapeutic benefit, especially for those patients at the more severe end of the clinical spectrum. While this will no doubt change as understanding of the condition develops, it is critical for the clinician to recognise that the patient's experience of both pain and associated symptoms, such as fatigue or temperature sensitivity, while variable in intensity, very often impacts significantly on daily functionality, as well as mental and emotional state, even when on medication. In this context, psychosocial management is a crucial element of the treatment of patients with fibromyalgia.

Many patients who present with features of the syndrome will either not be aware that such a condition exists, or will have had their pain experience negated by sceptical clinicians, because no objective disease parameters will have been found during special investigation. (The abnormalities in the brain and stress pathways are inevitably not under the purview of standard investigations). However, once the diagnosis has been made, the most significant intervention is to acknowledge the experience of the patient. There is nothing more disheartening for someone who lives with intense pain to have a health professional tell him or her that it is not real. This will establish and consolidate rapport and trust, and it is on this basis that the patient may be educated more fully about the nature and treatment of the condition.

These educational elements should include discussing the pathophysiology process in the context of a biopsychosocial model, and dispelling the myth that because there is no organic cause, that the disease is psychogenic.²⁵ Contributing factors to be mentioned include genetic abnormalities; physical trauma, such as a motor vehicle accident; chronic psychosocial stress; and sexual or emotional abuse.²⁶ Furthermore, patients should be educated that there is no singular, effective treatment, and an integrative and participatory approach is essential.

The evidence for therapeutic effectiveness is strongest in multi-modal programmes.²⁷ However, the impact of specific interventions is well documented.

Body-based therapies that enhance flexibility and movement, such as yoga, tai chi and chi gong, have shown promising results, both as stand-alone interventions, and alongside other therapies, such as mindfulness interventions.^{23,28,29}

Relaxation techniques are commonly used as part of a cognitive-behavioural intervention. Techniques that have been studied include biofeedback using heart rate variability, progressive muscular relaxation, and guided imagery. Most of these techniques have been shown to improve functionality and self-efficacy in managing pain, without directly relieving symptoms, while in the case of biofeedback, improvement has been shown in pain and sleep disruption symptoms.³⁰

Mindfulness-based stress reduction used on patients with fibromyalgia has been shown to reduce stress, anxiety and depression, as well as enhance quality of life.³¹ In addition, mindfulness, used in conjunction with qi gong, has shown improvements in pain symptoms and functionality. However, these results were no better than those obtained from an educational control group.²⁸

The most consistently positive results in pain reduction have been shown using cognitive behavioural therapy (CBT). Patients are educated about their condition; taught skills, i.e. relaxation techniques; are supported in effective self-regulation, i.e. how to mobilise when in pain, and not over-exert when feeling well; and how to identify and manage negative thoughts. Given these results, and the emerging data supporting exercise and pharmacotherapy, multimodal CBT interventions, alongside these other treatments, show much promise, and are the subject of further investigation.³⁰

Dietary interventions for patients with fibromyalgia

Dietary modification is often attempted as a non-pharmacologic method to assist with symptom management in patients with fibromyalgia. Many patients with fibromyalgia alter their dietary intake in an attempt to alleviate symptoms, and seek guidance on dietary optimisation. Despite inconclusive results on the efficacy of various dietary components and approaches, dietary modifications remain important, and dietary guidance should be included as a component of a comprehensive management strategy.³²

Obesity

A relationship seems to exist between various forms of chronic pain, as is characteristic in fibromyalgia, and body mass index (BMI).³³ Given the that the prevalence of overweight and obesity is higher in patients with fibromyalgia than in the general population, interventions that have demonstrated positive treatment results in alleviating fibromyalgia symptoms (such as improved physical functioning), include those that focus on healthy weight maintenance.^{33,34} Furthermore, due to the association between increased muscle tenderness and obesity, weight loss strategies should be included in the comprehensive management of overweight and obese patients with fibromyalgia.³⁵

Nutritional deficiencies

It has been suggested that patients with fibromyalgia suffer from certain nutritional deficiencies, particularly iron, vitamin D, zinc, magnesium, selenium, iodine, branched chain amino acids, and melatonin.³⁴ These deficiencies have also been linked to osteoporosis, anaemia, hypothyroidism, and other metabolic disorders in these patients. However, to date, no definitive relationships between nutrient deficiencies and these conditions have been established.³⁴

Dietary supplementation has been suggested as a means to prevent possible nutrient deficiencies.³⁴ More specifically, magnesium supplementation has demonstrated positive results in reducing symptoms.³⁶ However, trials on other vitamins and mineral supplementation were shown to be predominantly ineffective.³⁶ Although certain food supplements have demonstrated positive results in patients with fibromyalgia, no general recommendations around food and nutrient supplements can be made in the treatment of this condition, and further investigation in this regard is warranted.

An inflammatory state?

Fibromyalgia is a rheumatological disease. Some of the main concerns are chronic inflammation and oxidative stress, and subsequently, elevated levels of free radicals.³⁴ Some studies have illustrated suboptimal antioxidant levels in patients with fibromyalgia. Subsequently, diets that are rich in antioxidants, such as vegetarian diets, and dietary supplementation with antioxidants, have been suggested as means to increase antioxidant concentrations in these patients. Some studies have yielded positive results with respect to symptom relief, while others have not been shown to yield superior results to other interventions.³⁷ This area of research warrants further investigation.

Dietary support remains an important part of the comprehensive multidisciplinary management of patients with fibromyalgia, and should aim to assist improve overall dietary intake, to avoid possible nutrient deficiencies, and to maintain a healthy body weight, with the main objective of improving overall health and quality of life.

Conclusion

This article has provided an overview of some basic lifestyle modifications to consider in the management of patients with fibromyalgia. A holistic view, with respect to exercise training, dietary modification, and psychosocial interventions alone, or in combination with pain management and anti-depressant medications, is important in patient management. In particular, general practitioners, rheumatologists, psychiatrists and psychologists, should be aware of the benefits of a multidisciplinary approach to lifestyle interventions, to assist their patients who suffer from this difficult chronic disease. All patients should be afforded the time and interest of their practitioners, who should assist patients in making well-informed choices with respect to their lifestyle, in order to promote health and mental well-being.

References

- Wolfe F, Smythe HA, Yunus MB, et al. The American College of Rheumatology 1990 criteria for the classification of fibromyalgia. Report of the Multicenter Criteria Committee. *Arthritis Rheum.* 1990;33(2):160-172.
- Clauw DJ, Crofford LJ. Chronic widespread pain and fibromyalgia: what we know, and what we need to know. *Best Pract Res Clin Rheumatol.* 2003;17(4):685-701.
- Lawrence RC, Felson DT, Helmick CG, et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part II. *Arthritis Rheum.* 2008;58(1):26-35.
- White KP, Speechley M, Harth M, Ostbye T. The London Fibromyalgia Epidemiology Study: direct health care costs of fibromyalgia syndrome in London, Canada. *J Rheumatol.* 1999;26(4):885-889.
- Berger A, Dukes E, Martin S, et al. Characteristics and healthcare costs of patients with fibromyalgia syndrome. *Int J Clin Pract.* 2007;61(9):1498-1508.
- Sicras-Mainar A, Rejas J, Navarro R, et al. Treating patients with fibromyalgia in primary care settings under routine medical practice: a claim database cost and burden of illness study. *Arthritis Res Ther.* 2009;11(2):R54.
- Carville SF, Arendt-Nielsen S, Bliddal H, et al. EULAR evidence-based recommendations for the management of fibromyalgia syndrome. *Ann Rheum Dis.* 2008;67(4):536-541.
- Kelley GA, Kelley KS, Hootman JM, Jones DL. Exercise and global well-being in community-dwelling adults with fibromyalgia: a systematic review with meta-analysis. *BMC Public Health.* 2010;10:198.
- Hauser W, Klose P, Langhorst J, et al. Efficacy of different types of aerobic exercise in fibromyalgia syndrome: a systematic review and meta-analysis of randomised controlled trials. *Arthritis Res Ther.* 2010;12(3):R79.
- Busch AJ, Schachter CL, Overend TJ, et al. Exercise for fibromyalgia: a systematic review. *J Rheumatol.* 2008;35(6):1130-1144.
- Busch AJ, Webber SC, Brachaniec M, et al. Exercise therapy for fibromyalgia. *Curr Pain Headache Rep.* 2011;15(5):358-367.
- Thomas EN, Blotman F. Aerobic exercise in fibromyalgia: a practical review. *Rheumatol Int.* 2010;30(9):1143-1150.
- Hoeger Bement MK, Weyer A, Hartley S, et al. Pain perception after isometric exercise in women with fibromyalgia. *Arch Phys Med Rehabil.* 2011;92(1):89-95.
- Cazzola M, Atzeni F, Salaffi F, et al. Which kind of exercise is best in fibromyalgia therapeutic programmes? A practical review. *Clin Exp Rheumatol.* 2010;28(6 Suppl 63):S117-S124.
- Garcia-Martinez AM, De Paz JA, Marquez S. Effects of an exercise programme on self-esteem, self-concept and quality of life in women with fibromyalgia: a randomized controlled trial. *Rheumatol Int.* 2011 [Epub ahead of print].
- Figuroa A, Kingsley JD, McMillan V, Panton LB. Resistance exercise training improves heart rate variability in women with fibromyalgia. *Clin Physiol Funct Imaging.* 2008;28(1):49-54.
- Jones KD, Liptan GL. Exercise interventions in fibromyalgia: clinical applications from the evidence. *Rheum Dis Clin North Am.* 2009;35(2):373-391.
- Gowans SE. Fibromyalgia: Increased regular physical activity as "exercise" in fibromyalgia. *Nat Rev Rheumatol.* 2010;6(9):499-500.
- Lemos MC, Valim V, Zandonade E, Natour J. Intensity level for exercise training in fibromyalgia by using mathematical models. *BMC Musculoskelet Disord.* 2010;11:54.
- Calandre EP, Rodriguez-Claro ML, Rico-Villademoros F, et al. Effects of pool-based exercise in fibromyalgia symptomatology and sleep quality: a prospective randomised comparison between stretching and Ai Chi. *Clin Exp Rheumatol.* 2009;27(5 Suppl 56):S21-S28.
- Mannerkorpi K, Nordeman L, Ericsson A, Arndorw M. Pool exercise for patients with fibromyalgia or chronic widespread pain: a randomized controlled trial and subgroup analyses. *J Rehabil Med.* 2009;41(9):751-760.
- Matsumoto S, Shimodozono M, Etoh S, et al. Effects of thermal therapy combining sauna therapy and underwater exercise in patients with fibromyalgia. *Complement Ther Clin Pract.* 2011;17(3):162-166.
- Chen KW, Hassett AL, Hou F, et al. A pilot study of external qigong therapy for patients with fibromyalgia. *J Altern Complement Med.* 2006;12(9):851-856.
- Rooks DS. Talking to patients with fibromyalgia about physical activity and exercise. *Curr Opin Rheumatol.* 2008;20(2):208-212.
- Goldenberg DL. Multidisciplinary modalities in the treatment of fibromyalgia. *J Clin Psychiatry.* 2008;69(Suppl 2):30-34.
- Bradley LA. Pathophysiology of fibromyalgia. *Am J Med.* 2009;122(12 Suppl):S22-S30.
- Smith HS, Harris R, Clauw D. Fibromyalgia: an afferent processing disorder leading to a complex pain generalized syndrome. *Pain Physician.* 2011;14(2):E217-E45.
- Astin JA, Berman BM, Bausell B, et al. The efficacy of mindfulness meditation plus Qigong movement therapy in the treatment of fibromyalgia: a randomized controlled trial. *J Rheumatol.* 2003;30(10):2257-2262.
- Taggart HM, Arslanian CL, Bae S, Singh K. Effects of T'ai Chi exercise on fibromyalgia symptoms and health-related quality of life. *Orthop Nurs.* 2003;22(5):353-360.
- Thieme K, Gracely RH. Are psychological treatments effective for fibromyalgia pain? *Curr Rheumatol Rep.* 2009;11(6):443-450.
- Schmidt S, Grossman P, Schwarzer B, et al. Treating fibromyalgia with mindfulness-based stress reduction: results from a 3-armed randomized controlled trial. *Pain.* 2011;152(2):361-369.
- Holton KF, Kindler LL, Jones KD. Potential dietary links to central sensitization in fibromyalgia: past reports and future directions. *Rheum Dis Clin North Am.* 2009;35(2):409-420.
- Yunus MB, Arslan S, Aldag JC. Relationship between body mass index and fibromyalgia features. *Scand J Rheumatol.* 2002;31(1):27-31.
- Arranz LI, Canela MA, Rafecas M. Fibromyalgia and nutrition, what do we know? *Rheumatol Int.* 2010;30(11):1417-1427.
- Neumann L, Lerner E, Glazer Y, et al. A cross-sectional study of the relationship between body mass index and clinical characteristics, tenderness measures, quality of life, and physical functioning in fibromyalgia patients. *Clin Rheumatol.* 2008;27(12):1543-1547.
- Porter NS, Jason LA, Boulton A, et al. Alternative medical interventions used in the treatment and management of myalgic encephalomyelitis/chronic fatigue syndrome and fibromyalgia. *J Altern Complement Med.* 2010;16(3):235-249.
- Baranowsky J, Klose P, Musial F, et al. Qualitative systemic review of randomized controlled trials on complementary and alternative medicine treatments in fibromyalgia. *Rheumatol Int.* 2009;30(1):1-21.

