Use of physiotherapy resources for patients with fibromyalgia

A utilização de recursos fisioterapêuticos para portadores de fibromialgia

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ABSTRACT
Introduction: Fibromyalgia is a non-inflammatory rheumatic syndrome of unknown etiology manifested in the musculoskeletal system through diffuse and chronic pain and presence of tender points, which may be associated with fatigue, anxiety, muscle stiffness, skin sensitivity, pain after exercise, functional impairment and sleep disorders. Objective: This study aimed to perform a systematic literature review in order to check which physiotherapy resources are mostly used today and what are the most significant results in the treatment of fibromyalgia. Method: An integrative literature review was conducted by searching electronic databases of indexed data such as Latin American and Caribbean Health Sciences (LILACS), MEDLINE/ PubMed and Scientific Electronic Library Online (SCIELO). Randomized clinical trials were selected in the period from January 2001 to June 2013 published in Portuguese, English and Spanish. Methodological quality was assessed using the Jadad Quality Scale. Results: Overall, 522 studies were reviewed in full and only 13 were included after application of the exclusion criteria. Among these, articles that addressed the use of electrotherapic resources (n = 4), hydrotherapy (n = 3), conventional therapy (n = 3), physical exercise (n = 2) and multidisciplinary treatment (n = 1) were identified, with diversified results, protocols and application times of each methodology. Conclusion: It has been found that there are a small number of studies with scientific relevance published in the last 10 years evidencing techniques that have obtained better results in the treatment of patients with fibromyalgia. Further studies with better design aimed at obtaining more conclusive results should be conducted.

Keywords: Fibromyalgia; Physiotherapy; Physiotherapy resources.

RESUMO
Introdução: A fibromialgia é uma síndrome reumática não inflamatória, de etiologia desconhecida, que se manifesta no sistema musculoesquelético, por meio de dor difusa e crônica, presença de pontos sensíveis (tender points), podendo estar associada com a fadiga, a ansiedade, a rigidez muscular, a sensibilidade cutânea, a dor após o exercício físico, a incapacidade funcional e a anormalidades do sono. Objetivo: O estudo teve como objetivo realizar uma revisão sistemática da literatura, no intuito de verificar quais os recursos fisioterapêuticos mais utilizados na atualidade, como também quais os resultados mais significativos no tratamento da fibromialgia. Método: Foi realizado um estudo integrativo de uma revisão da literatura, por meio de busca nas bases eletrônicas de dados informatizados e indexadas, como Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), MEDLINE/Pubmed e Scientific Electronic Library Online (SCIELO). Foram selecionados ensaios clínicos randomizados, entre os períodos de janeiro de 2001 a junho de 2013, em língua portuguesa, inglesa e espanhola. A qualidade metodológica foi verificada através da Escala de Qualidade de Jadad. Resultados: 522 estudos foram revisados na integra, sendo que somente 13 foram incluídos após aplicação dos critérios de exclusão. Dentre estes, foram identificados artigos que abordaram a utilização de recursos eletroterapêicos (n = 4), hidroterapia (n = 3), fisioterapia convencional (n = 3), exercícios físicos (n = 2) e tratamento multidisciplinar (n = 1), sendo diversificados os resultados, protocolos e tempos de aplicação referentes a cada modalidade. Conclusão: Foi constatada a existência de um número pequeno de estudos, com relevância científica, publicados nos últimos 10 anos, evidenciando as técnicas que obtiveram melhores resultados no tratamento dos portadores de fibromialgia. Torna-se necessário a elaboração de estudos com um melhor delineamento, ensejando resultados mais conclusivos.

Palavras-chave: Fibromialgia; Fisioterapia; Recursos fisioterapêuticos.
INTRODUCTION

Fibromyalgia is a non-inflammatory rheumatic syndrome of unknown etiology, manifested in the musculoskeletal system through diffuse and chronic pain, presence of tender points and may be associated with fatigue, anxiety, muscle stiffness, skin sensitivity, pain after exercise, functional impairment and sleep abnormalities.(1)

The global average prevalence is 2.7%, ranging from 0.4% in Greece to 9.3% in Tunisia. In continental terms, the average is 3.1% in the Americas, 2.5% in Europe and 1.7% in Asia. Regarding gender, the average is 4.2% (female) and 1.4% (male). In Brazil, a study was conducted on the prevalence of rheumatic diseases in which fibromyalgia, occurred in 2.5% the population of Montes Claros in Minas Gerais. Another study conducted with elderly found the prevalence of 5.5%, the most common symptom pain in women than men. (4)

Initially, the criteria for the diagnosis of fibromyalgia have been defined by the American College of Rheumatology (ACR) in 1990. From 2010 new diagnostic criteria were introduced, using a self-administered questionnaire is recommended, more suitable for epidemiological studies population-based, on basic health care. (5-7)

Ozgocmen et al.(8) reported that there is a trend of increasing prevalence of fibromyalgia in fibromyalgia patients relatives, relating found the genetic and environmental factors. The region of chromosome 17p11.2-q11.2 showed suggestive evidence of connection with fibromyalgia, particularly in the serotonin transporter gene (SLC6A4) and transient receptor potential vanilloid 2 (TRPV2). (9)

Some neurotransmitters such as serotonin, norepinephrine, dopamine, substance P, and endorphins, enkephalins target proved to be during the course of the hyperactive syndrome. As regards tender points, some viruses, such as coxsackie B and parvovirus seem to be involved. Some cytokines express receptors for bacteria and viruses, may also be some connection between them. (10)

The symptoms of fibromyalgia often cause great impact on the daily lives of its carriers, providing a break from the routine, the consequence of which tends to maintain over time, due to the chronic nature of the disease. (12) In all patients the diffuse and chronic pain is the presenting symptom involving the peripheral and axial skeleton. The character of the pain is variable and can be burning, stabbing, weight, “fatigue type” or a bruise. The main symptoms that affect fibromyalgia patients are sleep disturbance, fatigue and stiffness in the body. Other symptoms such as skin sensitivity, irritable bowel syndrome, irritable bladder syndrome, cognitive disorders, migraine, dizziness, fluid retention, paresthesia, Raynaud’s phenomenon, temporomandibular dysfunction, mood swings, anxiety and depression are also commonly found. (13-14) High levels of pain in patients with fibromyalgia can interfere with the development of professional and social activities, motor and cognitive tasks as well as the destabilization of family relationships. (4) Depression is often linked to reduced quality of life. (12)

Frequently, the therapeutic approach used in the treatment of fibromyalgia is directed only to the alleviation of symptoms. Physical therapy plays an important role in addressing this grievance through several of its therapeutic features such as electrotherapy, hydrotherapy and kinesiotherapy, among others, contributing to the reduction of pain, to improve flexibility and strength muscle, restoring restorative sleep, improve self-esteem, sense of well-being and consequently improving the quality of life of patients with fibromyalgia. (16-17)

The hydrotherapy has been used more frequently in the treatment of fibromyalgia to promote different reactions from those experienced on the ground. Thus, aquatic exercises are well tolerated because the water thermal environment helps to reduce pain and muscle spasms, increasing total sleep time (VITORINO, et al., 2006), improving peripheral circulation, benefiting venous return, as well as providing a massager and relaxing effect. (19)

The transcutaneous electrical nerve stimulation (TENS) has produced important results in the fight against pain. (20) TENS is a method to produce pain relief by applying a biphasic rectangular wave pulse through electrodes on the skin surface. Depending on the modulation frequency, the working principle of TENS is associated with the gate control theory of pain or the release of endogenous opioids. (21) The low frequency TENS increases β-endorphin and serotonin levels in the nervous system central. (22)

Therapeutic exercise is widely used in improving the quality of life being effective in reducing the symptoms of individuals with fibromyalgia. (23) Aerobic exercise of low intensity and stretching on the ground improves pain, functional capacity, physical and social aspects and mental health. (24)

Based on these assumptions, the study aims to systematically review the literature in order to check which physical therapy resources most used today, but also what are the most significant results in the treatment of fibromyalgia.

METHODS

We performed an integrative review of literature through electronic databases of computerized and indexed data, searching for scientific articles in databases of health sciences in general and Latin American and Caribbean Health Sciences (LILACS), MEDLINE/PubMed and Scientific Electronic Library Online (SciELO) using the following key words and their combinations: fibromyalgia, physiotherapy, electrotherapy, hidrotherapy, exercise and kinesiotherapy.

Scripts were used for structured design of the research. The articles identified were considered for analysis when it came to original studies available in its entirety through access to the Journals Portal of Periódicos da Coordenação de Aperfeiçoamento Pessoal de Nível Superior (CAPES), keeping the terminology of the authors, published in Portuguese,
English or Spain, from January 2001 to June 2013, which made reference in its content resources and physical therapy techniques related to fibromyalgia patients.

It was adopted as exclusion criteria review articles, experimental animal studies, case reports and editorials, completion of course work are, items only relating to quality of life, dissertations and theses, i.e. documents they were not in article format, items not explored the theme of the study or not detailed protocols and score on the Jadad Quality Scale less than 3.

To verify the quality of the studies was applied to Jadad Quality scale,\(^{(25)}\) whose scores (randomness, random, double blind, masking, description of losses and exclusions) of less than 3 were not considered methodological quality. Were presented the results of this review, the studies that characterized the randomized clinical trials.

### RESULTS

Table 1 shows the results of the descriptors used in the research, were identified 522 articles, distributed in the LILACS database - 22 articles in SCIELO base - 04 articles and Medline/PubMed - 496 articles. The search strategy with fibromyalgia descriptors and physiotherapy was the one with the greatest number of articles in three databases (420 publications).

The study excluded 509 articles that not fit the inclusion criteria of the study. Of these, the full text was not available in 183 papers, review articles totaled 118 publications, 93 studies did not show adequate methodological quality, according to JADAD scale, not explored the theme of the study or not detailed its protocols in 78 papers 23 publications were not in article format, case reports totaled 6 articles and 5 articles were not written in the language proposed by the survey (Figure 1).

After applying the exclusion criteria, 13 studies remained the Medline/PubMed database, included in this review, aiming to analyze the use of hydrotherapy, electrotherapy and therapeutic exercise in treating fibromyalgia (Table 2). The search with fibromyalgia descriptors and physiotherapy was the one with the largest number of articles (11 publications).

The criteria of methodological of Jadad quality scale (1996), the jobs gained 3 points or more were included and considered potentially relevant. Of the 13 studies selected, all had adequate randomization and showed a good method of masking. Among the articles, five were described as double-blind, three reported no losses and larger deletions than 10% of the sample (Table 3 and Table 4).

### DISCUSSION

This systematic review was conducted using as a tool the Jadad scale, allowing evaluate clinical studies, published in leading databases, addressing the use of physical therapy

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**Table 1. Statement of articles indexed in the databases searched.**

<table>
<thead>
<tr>
<th>Descriptors</th>
<th>LILACS</th>
<th>SCIELO</th>
<th>MEDLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibromyalgia and physiotherapy</td>
<td>10</td>
<td>2</td>
<td>420</td>
</tr>
<tr>
<td>Fibromyalgia and exercise and kinesiotherapy</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fibromyalgia and electrotherapy</td>
<td>2</td>
<td>-</td>
<td>46</td>
</tr>
<tr>
<td>Fibromyalgia and hydrotherapy</td>
<td>9</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total articles</strong></td>
<td>522</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Statement of indexed articles included in the search.**

<table>
<thead>
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<tbody>
<tr>
<td>Fibromyalgia and physiotherapy</td>
<td>-</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Fibromyalgia and exercise and kinesiotherapy</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fibromyalgia and electrotherapy</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Fibromyalgia and hydrotherapy</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Articles included in the study</strong></td>
<td>0</td>
<td>0</td>
<td>13</td>
</tr>
</tbody>
</table>

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**Figure 1.** Statement of indexed items excluded in the search.
Table 4. Summary of the review.

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Type of study and sample size (n)</th>
<th>Study design</th>
<th>Duration of intervention (months)</th>
<th>Study losses</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVCIK et al., 2002</td>
<td>Randomized controlled clinical trial n=42</td>
<td>To evaluate the effectiveness of thermal therapy in the treatment of patients with fibromyalgia.</td>
<td>3 weeks</td>
<td>Not occurred</td>
<td>After completion of treatment with balneotherapy improvement was observed in the number of tender points, pain and symptoms of fibromyalgia.</td>
</tr>
<tr>
<td>DÖNMEZ et al., 2005</td>
<td>Randomized controlled clinical trial n=30</td>
<td>To compare the effects of spa therapy in relation to medical treatment commonly prescribed for patients with fibromyalgia.</td>
<td>2 weeks</td>
<td>yes</td>
<td>Treatment with spa therapy showed significant improvement in pain, reduction in tender point count, sleep disturbance, fatigue, and symptoms evidenced in FIQ Beck inventory up to 9 months after treatment.</td>
</tr>
<tr>
<td>FREGNI et al., 2006</td>
<td>Randomized controlled clinical trial n=32</td>
<td>To investigate whether treatment with electric transcranial direct-current stimulation results in relieving pain in patients with fibromyalgia.</td>
<td>40 days</td>
<td>yes</td>
<td>Conducted therapy in the primary motor cortex achieve a significant improvement in pain, anxiety and depression in this population.</td>
</tr>
<tr>
<td>VITORINO et al., 2006</td>
<td>Randomized controlled clinical trial n=50</td>
<td>To compare hydrotherapy and conventional therapy in the treatment of fibromyalgia, related quality of life, total sleep time and total time nap.</td>
<td>3 weeks</td>
<td>Yes</td>
<td>Any hydrotherapy as conventional therapy promotes improvements in quality of life, total sleep time, and decrease in total nap time, and hydrotherapy had the greatest effect on total sleep time, and decrease in total doze time on the population studied.</td>
</tr>
<tr>
<td>TOMAS-CARUS et al., 2007</td>
<td>Randomized controlled clinical trial n=34</td>
<td>Evaluate the effects of a period of water training and the quality of life related to health and physical fitness in women with fibromyalgia.</td>
<td>12 weeks</td>
<td>Not occurred</td>
<td>Significant positive effects of aquatic training were found in physical function, bodily pain, general health perceptions, vitality, social function, emotional problems and mental health, balance and climb stairs. After the intervention period, there was improvement in pain in the body and emotional problems were kept.</td>
</tr>
</tbody>
</table>
resources in addressing the symptoms of fibromyalgia, which is currently an important public health problem.

Regarding the use of electrotherapeutic resources for the relief of pain in patients with fibromyalgia, studies of the type randomized, controlled clinical trial \(^{26-28}\) used the direct current stimulation (TDCS) in the treatment of patients. Fregni et al.\(^{26}\) used a placebo group and two other groups, wherein one group received continuous current in the motor cortex and another group in the dorsolateral prefrontal cortex of the left side, and shows consisting of 32 female patients. They concluded that the therapy conducted in primary motor cortex obtained a significant improvement in painful symptoms \((p = 0.05)\) and anxiety \((p < 0.0001)\). In the study by Mendonca et al.\(^{27}\) was carried out with 30 patients, the same modulation

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</tr>
</thead>
<tbody>
<tr>
<td>EVCIK et al., 2008.</td>
<td>Randomized controlled clinical trial n=63</td>
<td>To investigate the effectiveness of aquatic exercise in fibromyalgia syndrome.</td>
<td>5 weeks</td>
<td>Yes</td>
<td>At the end of treatment was observed improvements in the FIQ scores and decrease in the number of tender points. There were improvements in depression and levels of pain after aquatic therapy.</td>
</tr>
<tr>
<td>ALTAN et al., 2009.</td>
<td>Randomized, prospective, blinded and controlled n=50</td>
<td>To investigate the effect of Pilates against pain, functional status and quality of life in patients with fibromyalgia.</td>
<td>12 weeks</td>
<td>Yes</td>
<td>Both in the treatment group as Pilates the exercise group were improvements in FIQ parameters and pain. After 12 weeks of treatment group was treated with pilates who remained with effective results.</td>
</tr>
<tr>
<td>TOMAS-CARUS et al., 2009.</td>
<td>Randomized controlled clinical trial n=30</td>
<td>To assess changes in muscle strength during 32 weeks of supervised aquatic training, quality of life and postural balance.</td>
<td>32 weeks</td>
<td>Yes</td>
<td>After treatment with exercise found improvements in the strength of flexor and extensor muscles of the knee (concentric), knee extensors (eccentric) and postural balance. The treatment also led to improvements in physical function (pain, mental health, vitality, emotional problems, physical and mental health).</td>
</tr>
<tr>
<td>MENDONÇA et al., 2011.</td>
<td>Randomized, prospective, blinded and controlled n=30</td>
<td>To determine the distribution of current and analgesic effects in the short term electric transcranial direct-current stimulation in fibromyalgia</td>
<td>10 months</td>
<td>Not occured</td>
<td>The groups treated with Cathode-SO and Anode-SO were followed improvement of pain in fibromyalgia patients.</td>
</tr>
<tr>
<td>SAÑUDO et al., 2011.</td>
<td>Randomized controlled clinical trial n=42</td>
<td>To assess the impact of a program combining aerobic, strength and flexibility versus usual care in the perception of health, functional capacity, health and depression in patients with fibromyalgia.</td>
<td>24 weeks</td>
<td>Yes</td>
<td>The results showed that the combined program of moderate exercise applied twice a week improved the function and quality of life of patients with fibromyalgia.</td>
</tr>
<tr>
<td>CASANUEVA- FERNANDEZ et al., 2011.</td>
<td>Randomized, prospective, double blinded and controlled n=34</td>
<td>To evaluate the effectiveness of a multidisciplinary treatment (massage, ischemic pressure, aerobic exercise and thermotherapy) in severely affected patients with fibromyalgia.</td>
<td>8 weeks</td>
<td>Yes</td>
<td>At the end of treatment there was significant improvement in the experimental group compared to perceived health, social functioning, grip strength test and the six-minute walk.</td>
</tr>
<tr>
<td>HARGROVE et al., 2012.</td>
<td>Prospective, double-blind, placebo controlled. n= 77</td>
<td>To evaluate the efficacy, safety and tolerability of noninvasive cortical electrical stimulation in the treatment of fibromyalgia.</td>
<td>11 weeks</td>
<td>Yes</td>
<td>There was improvement in the active treatment group patients in the number of tender points, pain threshold, fatigue and restful sleep.</td>
</tr>
<tr>
<td>TAYLOR et al., 2013.</td>
<td>Randomized, prospective, double blinded and controlled n=57</td>
<td>To investigate the effects of electrical stimulation therapy cranial electrical microcurrent (CES) on activity in brain regions of pain processing.</td>
<td>8 weeks</td>
<td>Yes</td>
<td>Individuals who used the device had a great reduction in average pain than those who used a device or yesulador received usual care alone over time.</td>
</tr>
</tbody>
</table>
After 15 sessions, divided into 3 times a week for 5 weeks, control group received only exercises performed at home. 35 minutes of exercise in the pool heated to 33 ° C, while the with 20 minutes of exercises out of the pool, followed by (p = 0.05). Later, Evicik et al. (32) performed a new intervention, 15 sessions. Em relação ao grupo controle, verificaram uma improvement was observed in Impact Questionnaire scores of functional capacity (for the intervention group, p = 0.002 and for the control group, p = 0.001) compared to the reduction the number of tender points (for the intervention group, p = 0.009 and for the control group, p = 0.016) in reducing pain symptoms (for the intervention group, p < 0.001 and for the control group, p = 0.003) and symptoms of depression (for the intervention group, p = 0.005 and for the control group, p < 0.001). However, the beneficial effect remained only in the group that underwent hydrotherapy.

Regarding to conventional therapy, Vitorino et al. (33) conducted a randomized controlled trial to evaluate the quality of life, total sleep time and total nap time using a group, hydrotherapy, the exercises, stretching and relaxation and in the other group, infrared therapy, exercises, stretching and relaxation. At the end of the study, improved quality of life (P < 0.05) in both groups and all 24 patients in the treated group increased hydrotherapy 1 hour total sleep time (p < 0.01) and decreased total time nap (p < 0.05) compared to the group treated with infrared therapy. Another study in the aquatic environment was conducted by Tomas-Carus et al. (34) which used a water training technique and physical fitness, to evaluate the health and quality of life of the participants. After the water training, physical function and bodily pain improved significantly, with p = 0.029 and p = 0.030, respectively. Considering the quality of life indicators, with regard to general health perception, vitality, social function, emotional problems and mental health, all were significant. When analyzed the balance, the ability to climb stairs with and without resistance, significant results were obtained after a period of 3 months. However, only the reduction of body pain and the emotional problems were maintained. Later, Tomas-Carus et al. (35) assessed the impact of muscle strength after a water training supervised in the balance, and found improved quality of life in all domains of the SF-36, with the exception of social function. Although the applied protocols are different, the effects such as improvement of pain, reduction in the number of tender points and depression were equivalent and important, in most studies that have been conducted using the hydrotherapy. Thus, hydrotherapy is of fundamental importance for functional recovery and especially for the relief of pain in fibromyalgia patients.

The exercise of various forms, has been an important support in the recovery of patients with fibromyalgia. Altan et al. (36) in a randomized, prospective, 50 subjects evaluated the effect of Pilates technique in reducing pain symptoms, functional status and quality of life of patients with fibromyalgia. In the Pilates group were observed significant results regarding the improvement of pain, number of tender points, the scores of the impact of functional capacity, the Nottingham scores of the health profile and algometric scores, while the control group (intervention home exercises) improvements were identified only in the number of tender points and algometric scores.
CONCLUSION

This systematic review found that there were a small number of studies in various databases with scientific relevance, published in the last 10 years, highlighting the techniques have worked best in the treatment of fibromyalgia sufferers.

It is suggestive that future, larger and more systematic studies are organized to ensure a more adequate and well-defined protocol and a relevant epidemiological design and an appropriate and organized study model, so that there is a more concrete and relevant approach, featuring a scientific rigor, the opportunity to safer results.

AUTHOR’S CONTRIBUTION

AJSN: data collection, analysis and interpretation of data and the wording of article; MFAB and AGCC: conception, study design, data collection, analysis and interpretation of data and the wording of article; MGRA and NMGL: analysis and interpretation of data and the wording of article.

FINANCIAL COMPETING INTERESTS

The authors declare no conflict of interest.

REFERENCES