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Brazilian Scientific Journal of Health and Medicine (RBMED)
(Brazilian Scientific Journal of Health and Medicine) ISSN-e 3086-2477
Vol. 1, No. 1 | 2025

The effectiveness of low-level laser therapy as a therapeutic resource in relieving pain and improving quality of life in women diagnosed with fibromyalgia.

The effectiveness of low-intensity laser as a therapeutic resource in relieving pain and improving quality of life in women diagnosed with fibromyalgia

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Abstract:

Fibromyalgia is characterized by a set of signs and symptoms, the main complaint being diffuse and chronic pain in the musculoskeletal system. It is more prevalent in women aged 40 to 55 years, affecting 1% to 4% of the general population in many industrialized countries, and is the second most common rheumatological disorder. The objective of this study was to observe the influence of low-level laser therapy on pain relief and improved quality of life. Materials and methods: This is a literature review. The following databases were consulted: GOOGLE SCHOLAR, SCIELO, REVISTAS and PLATAFORMA PEDRO. The search terms were: Fibromyalgia, Low-Level Laser Therapy in Portuguese. 25 articles were found, of which 11 were selected for review, all in Portuguese. Results: The results demonstrate that laser therapy satisfactorily alleviates muscle pain. Conclusion: Low-level laser therapy is effective in reducing symptoms such as pain and depression, thereby providing a significant improvement in the quality of life for these women.

Keywords: Fibromyalgia; Low-Level Laser Therapy.

Abstract

Fibromyalgia is characterized by a set of signs and symptoms, the main complaint being diffuse and chronic pain in the musculoskeletal system. It is more prevalent in women aged 40 to 55, affecting 1% to 4% of the general population in many industrialized countries, and is the second most common rheumatological disorder. The objective of this study was to observe the influence of low-level laser therapy on pain relief and improved quality of life. Materials and methods: This is a literature review. The following databases were consulted: GOOGLE SCHOLAR, SCIELO, JOURNALS and PEDRO PLATFORM. The search terms were: Fibromyalgia, Low-Level Laser Therapy in Portuguese. 25 articles were found, of which 11 were selected for review, all in Portuguese. Results: The results demonstrate that laser therapy satisfactorily alleviates muscle pain. Conclusion: Low-level laser therapy is effective in reducing symptoms such as pain and depression, thereby providing a significant improvement in the quality of life of these women.

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1. Introduction

In the current medical field, fibromyalgia is used in the treatment and cure of diseases.

It occupies a prominent position. Being a chronic syndrome of order

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In rheumatology, diagnosis and treatment are almost always delayed.
inefficient, affecting a wide variety of age groups, and being responsible for
In the vast majority of cases, the cause is reduced professional performance and quality of life.
of its carriers. Its incidence varies from 2 to 5% depending on the location, being as
the second most common rheumatological disorder, the most prevalent in women,
affecting those between 35 and 50 years of age. The disease is closely linked to
sensitivity when subjected to a painful stimulus, its manifestations occur in
The musculoskeletal system, however, symptoms may present in other areas.
devices and systems. And due to a lack of clinical examinations or laboratory evidence that
While fibromyalgia may be diagnosed and treated in many cases, it is often confirmed that the condition is present.
performed incorrectly, leading the patient to emotional distress, worsening the condition.
even more so the symptoms of the disease. In this context, chronic pain resulting from the disease
It becomes a persistent condition, which leads to damage in the quality of life of the person.
The patient. Because it is an incurable disease, the goal of its treatment is...
focused on controlling its symptoms, not eliminating them, in order to alleviate the
problems arising from the disease, seeking a better quality of life for the
patients. Due to the lack of specific clinical tests, their diagnosis is often given late, in
that often the disease is detected through a clinical eye and medical expertise. Your
Treatment is carried out with medications, such as muscle relaxants and antidepressants.
and among other things, however, this often makes it impossible to achieve good results.
due to a low financial condition. This analysis demonstrates great
The importance of incorporating non-pharmacological treatment methods, such as exercise, is highlighted.
physics, which is a great alternative due to its low financial cost when compared
to the use of medications and especially to the benefits obtained, improving well-being.
The patient's physical and mental health is almost always satisfactory. Fibromyalgia reflects large...
challenges for doctors and healthcare professionals, such as full recognition and
Understanding the disease is crucial to achieving significant results in treatment.
It is understood that the treatment of this syndrome should be carried out by a team.
multidisciplinary, working individually, mainly relying on active participation
of the patient, so that there is a combination of pharmacological treatments and not
pharmacological. Given this, the present study sought to gather and organize, through

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A literature review on the effectiveness of Low-Level Laser Therapy in women who are victims of Fibromyalgia.1

Laser therapy, which involves the amplification of light through stimulated emission of radiation, is a process that... It has been used worldwide for the treatment of various diseases. Since 1960, research has been conducted to analyze the therapeutic influence of laser therapy. low power (LBP) or intensity, also known as "cold laser", "soft laser", "Photostimulation or biostimulation." Existing laser devices are classified depending on the type of their active medium. They can be solid, liquid, gaseous, Chemical, semiconductor, and fiber optic cables. Low-level laser therapy can emit a radiation in visible or invisible form, capable of producing radiation in spectral bands. extremely thin, intense and coherent electromagnetic fields that extend from infrared to ultraviolet, with wavelengths ranging from 600 nm to 1,000 nm, being athermic and non-invasive. The choice of the type of radiation to be The work performed is associated with the desired outcome of the laser application. In Laser-based treatments are available for musculoskeletal disorders. gallium arsenide (Ga-As) and helium-neon (He-Ne). And from time to time we also have some studies. with the use of gallium arsenide-bonded aluminum (GaAlAs) lasers. Of Benefits gained from laser therapy include the control of inflammatory processes, analgesic effect in bone, muscle, and tendon injuries in the acute and chronic phases. tissue repair, improved muscle performance, vasodilation and proliferation of microvessels, increased oxygen supply to the tissue, epithelial and endothelial proliferation and fibroblastic activity, increased collagen (COL) synthesis and phagocytic activity, thus resulting in the acceleration of the repair process, and the release of cytokines that will to reduce the inflammatory reaction. The response to biostimulation is directly related due to the following factors: amount of energy deposited in biological tissues, wavelength, energy density [Joules per cm^2 (J/cm^2)], power, and time application. Therefore, the penetration of radiation depends on the wavelength, so that the shorter the wavelength, the greater its therapeutic action. It is It is important to emphasize that there is an ideal dose for applying light, in the way that it is used. Doses that are lower or higher than ideal may result in adverse effects. unsatisfactory. Based on research, the World Association for Laser Therapy standardized some dosages for humans, therefore, for each therapeutic purpose,

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The tissue to be treated is given appropriate doses and wavelengths. It should be noted that...
The properties of the laser allow light to penetrate the surface of the skin, and the energy
The generated product is transferred directly to the target cell, without causing any damage to the tissue.
The laser does not have a directly curative effect, but it acts as an excellent...
analgesic agent, providing the body with a better response, through the
cellular biostimulation.[2]

2. Theoretical Framework

Fibromyalgia

Fibromyalgia is a word derived from the Latin fibro (fibrous tissue) and the Greek myo (tissue).
muscular), algos (pain) and ia (condition), initially proposed by Yunus and colleagues.
in 1981, with the intention of replacing the term fibrositis, which had been used until then to name
a particular type of rheumatism whose main characteristic was the presence
of painful muscle points upon palpation, based on the understanding that there was none,
In this disease, there is tissue inflammation.3
The most widely accepted pathophysiological concept of fibromyalgia is that it is a chronic syndrome.
Non-inflammatory amplifying pain, characterized by musculoskeletal pain and
of unknown etiology.4
And its characterization is given by specific points called (tender points) that...
They are sensitive and painful.5
The appearance of this syndrome is due to imbalances in the mechanism of
transmission of peripheral painful stimuli and pain-inhibiting stimuli,
It is characterized as a syndrome because it encompasses a series of clinical manifestations. Its
The most common complaint is related to diffuse and chronic pain in the musculoskeletal system.
Among the muscles involved, the area with the greatest impairment is in the portions
average muscle size, especially in the muscles involved in maintaining
posture (spine). Patients affected by the most advanced stage of the disease have
a great difficulty in defining the painful points, reporting pain all over the body,
They may present together or separately. Bilateral involvement.
It occurs throughout the body at the following points: occiput; cervical spine, at the level of the processes.
spinous processes C6 and C7; in the middle third of the sternocleidomastoid muscles; branch

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Horizontal axis of the trapezius muscles; long tendon of the biceps, bilateral, in the shoulders; intercostal muscles, at the level of the second parasternal space; medial epicondyles; spine lumbar region at the level of the spinous processes L4 and L5; posterior superior iliac crest; medial of the knee.1

Patients with fibromyalgia experience a significant reduction in strength and performance. muscular dystrophy when compared to people without the disease.6

These symptoms have a negative impact on the quality of life of these patients. a circumstance that leads to the appearance of high levels of stress, when compared with normal individuals.7

The American College of Rheumatology (ACR) confirms the diagnosis of Fibromyalgia by The presence of diffuse and chronic pain for approximately three months, associated with Pain monitoring in at least 11 of the 18 specific points (tender points) Sensitive to pressure of 4 kg.8

Laser

Physiotherapy utilizes non-pharmacological resources in a non-invasive way, which It provides analgesia similar to low-level laser therapy (LLLT), a non-invasive resource. It is painless and easily administered.9

Low-level laser therapy (LBP) produces negligible changes in temperature. (measured around 1°C), and in addition to having numerous effects in treating various Musculoskeletal changes also stimulate collagen metabolism and repair.10

The energy deposited by a laser onto biological tissue can influence positively affects cellular activity and the transmembrane ionic gradient. The bond (spatial) wavelength of a laser is lost in the first layers of the skin, where the wavelength Wavelength and dose characterize the biological effects obtained.11

A laser is a device that generates a beam of radiation, where its absorption occurs within of a band of light, varying from invisible to visible modes. We find it on the market a wide variety of laser models, the main models being separated into two groups, which are low-power lasers or therapeutic lasers, and High-power lasers, or surgical lasers. Low-power lasers operate in Power levels in milliwatts (MW) and the emitted radiation is not thermal; they are located within From the electromagnetic spectrum in the red to infrared range, the wavelengths of

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The wavelengths are between 330 and 1100 nm, and exclusively the lasers in that range.
Red radiation operates at wavelengths from 632 to 780 nm. Its use can be in a way...
used alone or as an adjunct to other treatments, it has a major role in
to modulate immune system cells, stimulate microcirculation, and increase proliferation.
and cell migration, activating the release of endorphins, thereby providing the action
analgesic, anti-inflammatory and wound healer.12

3. Methodology

This article aims to conduct a literature review on the following topics.
Fibromyalgia and low-level laser therapy with emphasis on the action of low-level laser therapy.
intensity in women diagnosed with Fibromyalgia. To develop this
For this work, consultations were carried out in specialized journals and articles on Google.
Academic, platform Pedro and Scielo between the years 2012 to 2016, being elaborated in
period from May to November 2016.

4. Results and Discussion

4.1 Results

A field study comprised of 9 women diagnosed with fibromyalgia, where the
These women underwent the evaluation protocol, and the outcomes assessed were...
Pain is measured by the threshold through the pressure exerted by the dolorimeter on the tender points and by...
overall intensity measured by the visual analog scale (VAS); and to assess the
To assess quality of life (QoL), two questionnaires were used: the Medical Outcomes Study.
36-item Short-Form Health Survey (SF-36) and the Fibromyalgia Impact Questionnaire (FIQ),
being performed before and after treatment. The study participants received
Treatment consisting of 10 consecutive sessions with an 830nm laser and a dosimetry of 5 J/cm² applied.
only in tender points that were painful to digital palpation. After treatment, it was observed
that physiotherapy intervention with laser therapy promotes a significant difference
in the variables pain, general health status, well-being, quality of life, and an improvement
general in the activities of daily living of women with fibromyalgia.13

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In a double-blind randomized clinical trial, in which the study consisted of 12
The participants received an intervention consisting of 8 sessions, with
Frequency of 2 sessions per week, with GaAlAs laser (780 nm, output power of 5 mw)
and continuous emission of 6.2 J/cm2) over the 18 tender points of Fibromyalgia. The sample
It was conducted randomly, distributed into two groups, Intervention Group (GI), in
Group X (GX) received laser treatment, and Group X (GX) received placebo laser treatment.
The assessment consisted of the Visual Analogue Scale and Pain Index.
Generalized; Symptom Severity Scale; Beck Depression Inventory;
SF-36 Generic Quality of Life Questionnaire; Impact of...
Fibromyalgia and Epworth Sleepiness Scale. At the end of treatment, both groups
The data were compared, and as the intragroup data were related, a difference was observed.
statistically significant in the variables pain, depression and in the domains of PAIN, EGS, AS
and SM of the SF-36 in the Intervention Group, showing a significant improvement in
quality of life for these women. The Placebo Group presented results only in
The variable quality of life, analyzed by the FIQ, is not relevant for comparison.
of intergroup variables at the post-intervention time point.14

4.2 Discussion

Fibromyalgia (FM) is a rheumatic syndrome of unknown etiology, where its
The main complaint is diffuse and chronic musculoskeletal pain. According to the College
According to the American College of Rheumatology (ARC), the criteria for diagnosing the syndrome are complaints
diffuse pain lasting at least three months, and tenderness on 11 or more
Of the 18 painful points upon digital palpation, tender points. With a greater dominance in
women aged between 40 and 55 years, representing 1% to 4% of the population.
common in many industrialized countries, being the second most prevalent disorder.
rheumatological, being surpassed only by the degenerative disease osteoarthritis, remaining
permanently associated with other functional syndromes, such as headache
chronic, thyroid disorder, irritable bowel syndrome, depression, and anxiety.4
Fibromyalgia is a chronic, systemic disease characterized by signs and symptoms such as
generalized muscle pain, sleep disorders, psychological changes, fatigue
Muscular pain, poor resistance to physical exertion, and joint stiffness.
of non-inflammatory origin, and also does not contain degenerative or progressive features,

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considering that it can occur in isolation or in association with other rheumatic diseases. Its prevalence is higher in women of reproductive age, however, affecting children, adolescents, and the elderly as well. Despite being a syndrome that It affects people all over the world, but its prevalence is not that high, which is equivalent to... 2%, and its pathophysiology has been as uncertain and multifactorial as its etiology. A It is more likely, then, that it is linked to an increase in responses to stimuli. painful, social, emotional, and family factors, physiological changes such as decreased of cardiovascular conditioning and muscle performance.15

This syndrome is an idiopathic and incurable disease, characterized by diffuse pain throughout the body. The entire patient's body may also exhibit orthostatic disability. sensitivity to cold, fatigue, hyperalgesia, allodynia, sleep disorders, anxiety, depression, headache, bowel dysfunction, mental and physical disorders, decline in quality of life, temporal summation of nociceptive stimuli, deficit of attention, cognition, and thus affecting mood.16

Another common alteration listed as a complaint by patients with FM occurs in gait, in which exhibit altered gait parameters, such as reduced speed of gait, cycle frequency, and stride length, these changes also presented in the gait of elderly people. These changes are present in the pattern of gait, due to the presence of muscle discomfort, muscle weakness, decreased range of motion. In which researchers found that women in middle age- Age groups with fibromyalgia (between 40 and 50 years old) showed a high incidence of drops when reported annually, reaching a percentage of (40% - 50%), becoming even higher when compared with the elderly population.17

Various factors such as genetic, endocrine, immunological, neurological, and/or reaction of

The genesis and evolution of the disease has been the subject of scientific studies and investigations, however. the results are inconclusive.18

Because its cause is unknown and it is difficult to treat, several aspects may be... associated with the onset of fibromyalgia. The factors that apparently have a greater A contributing factor to the syndrome is alterations in the autonomic nervous system such as dysfunctions in the basal patterns of neuroendocrine axes, serotonin and the catechol enzyme-o-methyltransferase (COMT).16

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Sometimes, this is due to some healthcare professionals being unfamiliar with the disease, and also the lack of resources.
to deepen the knowledge a little more in order to establish the specific therapy for
The treatment causes the symptoms to last longer until they are treated.
addressing the issue of functional limitations resulting from the syndrome and their respective
Given the impacts on quality of life, it is necessary to broaden the perspective on impact.
of the symptoms, because the affected areas become as important as the disease itself.
Physiotherapy aims to reduce symptoms, thus gaining control over them.
pain, thereby providing maintenance or improvement of functional abilities.
patients. In addition, another purpose of physiotherapy should be its educational role, for
that the gains achieved with the treatment can be maintained in the long term and that the
Patients are encouraged to become less dependent on healthcare.
More active and functional lifestyle habits that aid in the physical and emotional restoration of
patient.15
The use of low-level laser therapy has proven to be a very beneficial agent among...
Electrotherapy resources in physiotherapy, due to their high analgesic and anti-inflammatory action...
inflammatory and also an excellent performance in biostimulating processes of
tissue repair.19
Fibromyalgia treatment should be individualized and tailored to each individual.
Interdisciplinary. Including drug treatments, cognitive-behavioral therapy,
physical exercise programs, alternative therapies (such as acupuncture and homeopathy),
hydrotherapy, electrotherapy, and promoting self-management skills for the
Pain control and patient education. Low-level laser therapy (LLLT) is the modality.
the most recent therapy in pain treatment among many other therapies performed in
area of physiotherapy. Its action is mediated by hormonal/opioid mechanisms.
promoting an increase in circulating endorphins, peripheral neural stimulation,
regulating microcirculation, thereby interrupting this vicious cycle that increases
and perpetuates the pain, thus providing analgesia.14
There is a huge discrepancy regarding the appropriate dose and wavelength, the
which generates the need for research to evaluate such dosimetric parameters.20

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5. Conclusion

Fibromyalgia is a chronic, painful disorder characterized by multiple symptoms, in which
Its main characteristic is diffuse pain in the musculoskeletal system. This syndrome generates
negative impacts on various areas of patients' lives, including performance,
Motivation and quality of life. Which leads to some financial imbalances for
for patients and for the health system, due to the costs of diagnostic investigation and
Treatment. Physiotherapy utilizes electrotherapy as a tool.
Constant in the treatment of FM. And treatment with Low-Level Laser Therapy in
For women diagnosed with fibromyalgia, it has proven highly effective in reducing the symptoms.
of symptoms such as pain and depression, thereby providing a significant improvement.
in the quality of life of these women.

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