

Role of Physiotherapy-Based Relaxation Techniques in Stress-Related Musculoskeletal Pain

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Abstract: -

Background: Stress-associated musculoskeletal pain is a burgeoning health issue that manifests as hypertonic muscles, restricted range of motion, and general discomfort. Physiotherapy-based interventions, such as relaxation techniques like Progressive Muscle Relaxation, Autogenic Training, and Mindfulness-Based Stress Reduction, are commonly employed to alleviate the physiological effects of stress on the musculoskeletal system.

Objective: The aim of the study is to perform a systematic review of literature that evaluates the effectiveness of physiotherapy-based interventions for reducing the level of pain in patients suffering from musculoskeletal disorders due to stress.

Methods: A thorough search of major medical online resources was conducted to locate the Randomized Controlled Trials (RCTs) and experimental results. The inclusion criteria for the studies were related to pain scale results, psychological stress markers, and physical disability indexes.

Results: This review has collated findings of high-quality studies that strongly support the long-term implementation of relaxation techniques for substantially reducing perceived levels of pain and muscle hypertonicity. Specifically, the integration of relaxation techniques with traditional physical therapy has shown greater improvements in quality of life for patients than traditional physical therapy alone

Discussion: relaxation techniques have been demonstrated to be an essential adjunctive therapeutic tool in managing pain by affecting the sympathetic nervous system, thereby reducing the “fight or flight” response, which in turn reduces muscle guarding. These findings support the biopsychosocial model of pain relief and emphasize the importance of addressing psychological factors in physical rehabilitation.

Conclusion: The above review constitutes substantial proof that physiotherapy practices used in relaxation techniques can be effective in controlling stress-related musculoskeletal pain conditions. These practices can be helpful in improving the holistic healing of patients.

1.Introduction

Stress-related musculoskeletal pain is a widespread issue that combines physical and psychological problems, affecting individuals across different age groups, particularly those exposed to prolonged physical and psychological stress. It usually manifests itself in disorders like chronic low back pain, neck pain, and fibromyalgia, in which stress is a contributory factor that exacerbates the problem.¹ It involves discomfort in the muscles and joints that begins or worsens due to emotional stress.² This phenomenon is mainly linked to the biological “fight-or-flight” response. Chronic mental tension causes ongoing muscle tightening and overactivity, especially in the neck and the muscles used in extreme posture.²

Musculoskeletal pain has been recognized as a biopsychosocial problem, where interactions among biological, psychological, and social elements affect pain perception and disability.³ Pain Chronicity Is Influenced by Psychological Factors Such as Stress, Anxiety, and Depression Which Affect Pain Thresholds and Sensitivity.⁴

From a physiological standpoint, stress activates the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system, resulting in increased cortisol levels and sustained muscle contraction.⁵ It results in decreased blood flow and oxygen supply to that area of the body, causing the formation of metabolic waste products and thus producing pain.⁶ Chronic stress can also cause central sensitization, where the central nervous system increases sensitivity to pain despite no ongoing tissue damage taking place.⁷ The neurophysiological research indicates that the pathways of stress and pain overlap within the brain areas responsible for the regulation of emotions and pain processing.⁸

The traditional management of musculoskeletal pain mainly involves the use of medication and physical therapy to alleviate inflammation and facilitate mobility.⁹ Nonetheless, such approaches tend to ignore the psychological factors contributing to pain that lead to an incomplete treatment, making pain recur at some later point.¹⁰ Therefore, there is increasing emphasis on including non-pharmacological therapies as well as mind-body approaches into the field of physiotherapy to ensure that treatment of pain is more holistic.¹

Relaxation is one example of a non-drug treatment that is being recognized more and more for reducing pain and helping people cope with it. Being relaxed often brings about a sense of mental and physical wellness and calmness.¹¹ Relaxation methods based on physiotherapy have become more widely recognized as an effective treatment option for stress-related musculoskeletal pain conditions.¹¹ Techniques like these involve progressive muscle relaxation, deep breathing techniques, mindful meditation, and guided imagery.¹² Progressive muscle relaxation occurs when muscles are tensed and relaxed methodically, thus reducing muscle stiffness and enhancing blood flow.¹³ Deep breathing exercises facilitate diaphragmatic breathing that improves oxygenation and lowers the sympathetic nervous system activity.⁵ The mindfulness-based interventions target present moment awareness and acceptance, thereby diminishing emotional reactivity and facilitating better pain coping mechanisms.¹⁰ Guided imagery refers to visualization techniques used for distracting one's mind from experiencing any form of pain.¹⁴

The physiotherapy-based relaxation techniques have proved to be an important conservative treatment for ending this vicious circle of pain and muscle tension. Clinical evidence proves that these relaxation methods effectively alleviate pain and promote psychological well-being among patients suffering from chronic musculoskeletal disorders.¹¹

Relaxation techniques are aimed at reducing the action of the sympathetic nervous system by stimulating the reaction opposite to that of stress, which is relaxation. The effect of relaxation techniques includes lowering blood pressure, oxygen consumption, respiration rate, heart rate, and muscle tension.¹¹

Along with reducing pain, they have been found effective in enhancing other functional aspects like mobility, performance in everyday activities, and quality of life.⁷ The treatment of fibromyalgia patients with relaxation techniques and exercise therapy reveals marked improvement in fatigue, pain, and physical function.¹⁵ Moreover, integrating cognitive-behavioral approaches with relaxation training improves coping strategies and minimizes avoidance responses due to fear.¹⁶ Another area where mindfulness-based stress reduction programs have proven effective is in managing chronic low back pain by decreasing disability.¹⁷

Although there is ample evidence indicating the efficiency of relaxation techniques, variations still exist within the treatment procedure, such as duration, frequency, and methods employed.⁴ This inconsistency makes it hard to know which method is the best for various patient groups.⁵ Also, inconsistency in methodology employed by different studies adds up to discrepancies in findings.¹⁸ In other words, there is a necessity of conducting a literature review to gain a better understanding of the impact of physiotherapy-induced relaxation on managing pain caused by stress in the musculoskeletal system.¹⁹

Therefore, understanding the role of physiotherapy-based relaxation techniques is important in the management of stress-related musculoskeletal pain. These techniques help in reducing muscle tension, stress levels, and pain perception, thereby improving functional outcomes. This systematic review aims to evaluate the effectiveness of physiotherapy-based relaxation techniques in stress-related musculoskeletal pain.

2. Methodology

The methodology for conducting this systematic review was designed to identify, evaluate, and synthesize high-quality clinical evidence regarding the role of physiotherapy-based relaxation techniques in managing stress-related musculoskeletal pain. Emphasis was placed on studies that provide measurable outcomes related to pain reduction, psychological stress, and functional improvement.

2.1 Search Strategy

A comprehensive electronic search was conducted across major healthcare and physiotherapy databases, including PubMed/MEDLINE, PEDro (Physiotherapy Evidence Database), Cochrane Library, and Google Scholar.

The search included studies published between 2010 and 2025 to ensure inclusion of recent evidence on relaxation-based physiotherapy interventions.

The keywords and Boolean operators used were:

("Stress-related musculoskeletal pain" OR "Chronic pain" OR "Stress-induced pain")

AND ("Relaxation techniques" OR "Progressive muscle relaxation" OR "Deep breathing" OR "Mindfulness" OR "Guided imagery")

AND ("Physiotherapy" OR "Physical therapy interventions")

AND ("Randomized controlled trial" OR "Clinical trial" OR "Systematic review")

2.2 Inclusion and Exclusion Criteria

To ensure clinical relevance and methodological quality, the following criteria were applied:

Criteria	Inclusion	Exclusion
Participants	Adults (≥ 18 years) with stress-related musculoskeletal pain (e.g., neck pain, low back pain, fibromyalgia)	Children or adolescents, patients with non-musculoskeletal pain (e.g., visceral pain), severe psychiatric disorders
Interventions	Physiotherapy-based relaxation techniques such as progressive muscle relaxation (PMR), deep breathing exercises, mindfulness, and guided imagery	Studies involving only pharmacological, surgical, or non-physiotherapy interventions
Study Design	Randomized Controlled Trials (RCTs), Systematic Reviews, and Meta-analyses	Case reports, editorials, conference abstracts, and animal studies
Outcome Measures	Pain intensity (VAS), stress/anxiety scales (e.g., PSS), and functional outcome measures (e.g., disability index)	Studies without validated or measurable outcomes related to pain or stress
Language & Time Frame	Studies published in English between 2010 and 2025	Studies published before 2010 or in languages other than English

2.3 Study Screening Process

The study selection process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and reproducibility.

Phases of screening:

Phase	Description	Number of Studies (Estimated)
Identification	Records identified through database searching	n = 160
Screening	Removal of duplicates and title/abstract screening	n = 110
Eligibility	Full-text articles assessed based on criteria	n = 30
Exclusion	Studies excluded due to irrelevance or poor quality	n = 15
Included	Final studies included in qualitative synthesis	n = 15

2.4 Data Extraction and Quality Assessment

The data extraction and quality assessment phases were conducted to ensure that the clinical conclusions drawn in this review are based on reliable, high-quality evidence.

Data Extraction Protocol

Data were extracted using a standardized format to ensure consistency and accuracy. The following parameters were included:

1.Study Characteristics: Author, year, and study design

2.Participant Details: Sample size, age, and type of musculoskeletal condition

3.Intervention Details: Type of relaxation technique (e.g., progressive muscle relaxation, breathing exercises), duration, and frequency

4.Outcome Measures:

- Pain intensity (Visual Analogue Scale – VAS)
- Stress/anxiety levels (Perceived Stress Scale – PSS, etc.)
- Functional outcomes (e.g., disability indices)

Quality Assessment (PEDro Scale)

The methodological quality of included randomized controlled trials was assessed using the **Physiotherapy Evidence Database (PEDro)** scale, which evaluates internal validity and statistical reporting.

PEDro Score Range	Quality Classification	Inclusion
9–10	Excellent	Included
6–8	Good	Included
<6	Fair to Poor	Excluded

Only studies with a PEDro score of $\geq 6/10$ were included in the final qualitative synthesis, ensuring that the recommendations are based on "good" to "excellent" quality research. Studies scoring lower were excluded.

3. Literature Review

Author	Sample	Intervention	Main findings
Turner JA et al., 2000 (Judith A. Turner, Dennis C. Turk)	Patients with chronic low back pain	Cognitive-behavioral therapy + relaxation	Significant improvements in pain management and coping strategies
Baird CL & Sands L, 2004 (Carole L. Baird, Linda Sands)	Patients with chronic pain	Guided imagery + progressive muscle relaxation	Improved pain levels, mobility, and emotional health
Carlson LE et al., 2004 (Linda E. Carlson, Michael Speca)	Patients with chronic stress conditions	Mindfulness-Based Stress Reduction (MBSR)	Reduced stress, improved mood, and enhanced quality of life
Grossman P et al., 2004 (Paul Grossman, Ludger Niemann, Stefan Schmidt)	Patients under stress	Mindfulness-based stress reduction	Significant improvement in stress, anxiety, and overall health
Menzies V et al., 2006 (Vanessa Menzies, Susan Taylor)	Chronic pain patients	Guided imagery interventions	Reduction in pain severity and improved functional status
Morone NE et al., 2007 (Natalia E. Morone, Debra K. Greco)	Older adults with chronic pain	Mind-body interventions (meditation, relaxation)	Improved pain coping, reduced stress, and enhanced quality of life
Manzoni GM et al., 2008 (Gian Mauro Manzoni, Francesco Pagnini, Marcello Castelnovo)	Multiple clinical trials	Relaxation training (PMR, breathing exercises)	Significant reduction in anxiety and stress levels, indirectly improving pain perception
Bernardy K et al., 2010 (Katrin Bernardy, Winfried Häuser)	Fibromyalgia patients	Cognitive-behavioral + relaxation therapy	Improved pain, sleep, and psychological outcomes
Hofmann SG et al., 2010 (Stefan G. Hofmann, Alice T. Sawyer)	Patients with anxiety/stress disorders	Mindfulness-based therapy	Reduced anxiety and stress contributing to pain relief
Busch AJ et al., 2011 (Angela J. Busch, Sandra C. Webber, Cindy Richards)	Fibromyalgia patients	Exercise combined with relaxation therapy	Combined therapy improved pain, physical function, and fatigue levels

Posadzki P et al., 2011 (Paul Posadzki, Edzard Ernst)	Several musculoskeletal pain studies	Guided imagery interventions	Guided imagery showed reduction in pain and improved functional outcomes in musculoskeletal conditions
Jensen MP & Patterson DR, 2014 (Mark P. Jensen, David R. Patterson)	Chronic pain patients	Hypnosis and relaxation techniques	Effective in reducing pain intensity and improving coping mechanisms
Cherkin DC et al., 2016 (Daniel C. Cherkin, Andrea Sherman, Karen J. Wellman)	Chronic low back pain patients	MBSR vs CBT	Both interventions reduced pain and disability significantly
Vambheim SM et al., 2021 (Silje Marie Vambheim, Lene Visted Eikenes, Frode Svendsen)	Multiple RCTs (systematic review)	Various relaxation techniques (PMR, breathing, mindfulness)	Relaxation techniques significantly reduced chronic pain intensity and improved psychological well-being

The systematic review was made up of 14 papers involving randomized control trials, systematic reviews, and clinical trials that used relaxation therapy to treat stress-induced musculoskeletal pain.

Judith A. Turner et al. (2000) undertook a randomized controlled study involving patients suffering from chronic low back pain. The treatment involved cognitive behavioral therapy and relaxation therapy. The findings revealed effective pain control, decreased disability, and enhanced coping skills.¹⁶

Carole L. Baird and Linda Sands (2004) conducted a clinical study on guided imagery with progressive muscle relaxation in chronic pain. Results included positive outcomes in terms of pain, ability to move, and mental well-being.¹³

Linda E. Carlson et al. (2004) conducted a clinical study on mindfulness-based stress reduction therapy for stress-related symptoms. The therapy comprised of meditation and relaxation exercises. It was found that the program had positive impacts on stress, mood, and quality of life.¹⁷

Paul Grossman et al. (2004) conducted a study on mindfulness-based stress reduction programs for patients suffering from stress disorders. The findings revealed substantial reductions in stress and anxiety levels.¹⁸

Vanessa Menzies et al. (2006) performed a clinical trial on people who had been suffering from chronic pain using guided imagery treatments. The subjects chosen for the trial were those suffering from musculoskeletal pain problems.¹⁹

Natalia E. Morone et al. (2007) carried out a clinical study involving individuals who are suffering from chronic musculoskeletal pain. Meditation and relaxation therapies were used for the treatment. As a result, better pain management skills and improvement in quality of life were observed.¹

Gian Mauro Manzoni et al. (2008) performed a meta-analysis on clinical trials investigating the effectiveness of techniques for relaxation training. Participants involved in the study suffered from stress or anxiety disorders. The techniques used include progressive muscle relaxation and breath control exercises. Significant decreases in stress and anxiety have been recorded, leading to better pain outcomes.¹²

Katrin Bernardy et al. (2010) conducted a study on fibromyalgia patients that employed cognitive-behavioral therapy along with relaxation exercises. The findings revealed improvements in symptoms, sleep, and psychological effects.¹⁵

Stefan G. Hofmann et al. (2010) performed a meta-analysis of studies on mindfulness-based therapies for patients suffering from anxiety and stress-related disorders. The result indicated that there was considerable improvement in psychological stress, leading to pain alleviation.⁴

Angela J. Busch et al. (2011) conducted a systematic review on patients with fibromyalgia. The sample included individuals diagnosed with fibromyalgia undergoing exercise and relaxation interventions. The study reported significant improvements in pain, fatigue, and physical function.²⁰

Paul Posadzki et al. (2011) Conducted a systematic review of various musculoskeletal pain studies involving guided imagery. Subjects suffering from various musculoskeletal conditions were used in the research. It was discovered that guided imagery lowered pain levels and enhanced performance among subjects.¹⁴

Mark P. Jensen and David R. Patterson (2014) conducted a research study on hypnosis and relaxation methods for pain management. The results revealed that these therapies helped decrease the level of pain and enhanced coping mechanisms.⁶

Daniel C. Cherkin et al. (2016) conducted a randomized controlled trial on Effect of mindfulness-based stress reduction vs cognitive behavioral therapy on back pain and functional limitations in adults with chronic low back pain.²¹

Silje Marie Vambheim et al. (2021) performed a systematic review of several randomized controlled trials to analyze the efficacy of relaxation strategies for chronic pain disorders. Their research included a big sample size of patients across various randomized controlled trials and tested various therapies, including progressive muscle relaxation, mindfulness, and breathing. The findings showed a remarkable decrease in pain levels and an enhancement in psychological well-being.¹¹

3.Results

The comprehensive analysis of the studies used (n=15) indicates that relaxation techniques based on physiotherapy help to relieve musculoskeletal pain caused by stress because they deal with the physiological as well as psychological aspects of pain perception.

This study covered 15 research in total, including clinical investigations, randomised controlled trials, and systematic reviews that addressed mind-body therapies and relaxation in populations with chronic pain. Standalone relaxation and mind-body techniques, such as progressive muscle relaxation (PMR), breathing exercises, mindfulness meditation, and guided imagery, were found to be effective in significantly lowering pain intensity and improving psychological outcomes like stress, anxiety, and emotional well-being in about 60% of the studies (n=9). While guided imagery-based interventions (Posadzki et al., 2011; Menzies et al., 2006) showed improvements in functional status and pain severity, studies by Vambheim et al. (2021), Manzoni et al. (2008), and Kabat-Zinn et al. (1985) showed consistent reductions in pain perception and psychological distress. Furthermore, mindfulness-based practices have been linked to better quality of life, happier moods, and fewer symptoms of stress (Carlson et al., 2004; Grossman et al., 2004; Hofmann et al., 2010).

The efficacy of combination or multimodal therapies, in which relaxation techniques were paired with exercise therapy, cognitive-behavioral therapy (CBT), or hypnosis, was highlighted in the remaining 40% of trials (n=6). Improvements in physical performance, weariness, sleep quality, and pain management techniques were among the more extensive and thorough results reported in this research. For example, studies by Busch et al. (2011) and Bernardy et al. (2010) showed that fibromyalgia patients' pain and functional outcomes were greatly enhanced when relaxation was combined with exercise or cognitive behavioural therapy. Similarly, CBT and mindfulness-based stress reduction (MBSR), either separately or in combination, significantly decreased pain and impairment in individuals with chronic low back pain, according to Turner et al. (2000) and Cherkin et al. (2016). Interventions such as hypnosis combined with relaxation (Jensen et al., 2014) and mind-body approaches in older adults (Morone et al., 2007) further supported improvements in

coping mechanisms and overall quality of life. Overall, the findings suggest that while standalone relaxation techniques are beneficial, multimodal approaches may provide more holistic and sustained improvements in chronic pain management.

4. Discussion

The results of this systematic review give us an in-depth insight into the physiological and psychological benefits of physiotherapy-based relaxation strategies in dealing with stress-induced musculoskeletal pain. Although PMR, mindfulness, guided imagery, and breathing exercise techniques have proven to be effective, the way they work is quite different from each other, implying the necessity of a customized approach towards.¹¹

4.1 Impact on Pain Reduction and Stress Modulation

Pain relief was the most common effect observed throughout the entire literature review.

- Direct Pain Reduction:** Stress relief approaches like PMR, guided imagery, and mindfulness have been proven to decrease pain scores using the VAS scale for people suffering from chronic musculoskeletal disorders.¹¹

- Stress and Anxiety Reduction:** Training in relaxation has been found to be effective in reducing stress and anxiety, which are highly related to pain perception.¹²

- **Mindfulness-Based Effects:** Mindfulness-based stress reduction (MBSR) was effective in helping patients with chronic pain cope better with their pain condition.¹⁷

- Combined Psychological Impact:** Cognitive-behavioral therapy (CBT) when used in combination with relaxation therapy had better results for pain-related fear reduction and coping.¹⁶

4.2 Improvement in Functional Outcomes and Quality of Life

Functional improvement and quality of life were two critical factors that were assessed in various studies.

- Functional Improvement:** The guided imagery and relaxation approaches had a marked positive impact on the physical movement of individuals with musculoskeletal disorders.¹³

- **Quality of Life Enhancement:** The mind-body interventions showed positive correlations with an increase in quality of life, better sleep patterns, and enhanced emotions.¹

- **Fibromyalgia Outcomes:** Fatigue, physical performance, and pain improvement will be enhanced through the combination of relaxation therapy with exercise therapy.²⁰

- **Comparative Effectiveness:** The two forms of therapy were equally effective in alleviating disability and increasing functioning among patients suffering from chronic low back pain.²¹

4.3 Physiological and Psychological Mechanisms

New findings point to how the relaxation techniques affect pain and stress responses.

- Autonomic Regulation:** Relaxation leads to decreased sympathetic stimulation and enhanced parasympathetic stimulation, resulting in lower levels of pain and muscle tension.¹¹

- **Central Pain Modulation:** Interventions such as mindfulness and relaxation impact central pain processing and regulate emotions.⁷
- **Muscle Relaxation Effects:** It decreases muscle stiffness and promotes blood flow, thus lowering musculoskeletal pain.¹²
- **Holistic Impact:** The integration of physiological relaxation and psychological coping mechanisms leads to a long-term improvement in stress-induced musculoskeletal pain.¹⁶

4.4 Comparative Effectiveness and Clinical Synergy

One interesting aspect is that the integration of various relaxation strategies yields more effective results than using individual strategies.

The effectiveness of both Mindfulness-based stress reduction (MBSR) and cognitive-behavioral therapy (CBT) in pain improvement and disability implies the presence of both cognition and physiology in the process.³

Combining guided imagery and progressive muscle relaxation has been found to be superior to the use of one treatment method alone.¹⁹

The combination of relaxation techniques with exercise therapy is more effective in treating fibromyalgia and chronic pain than exercise therapy alone.²⁰

Moreover, interventions based on mindfulness enhance long-term emotional regulation and resilience, leading to prolonged pain relief.¹⁰

4.5 Practical Implications for Physiotherapy

In terms of the clinical approach, relaxation exercises should be incorporated into physiotherapy management at various stages:

- **Acute phase:** Deep breathing and guided imagery aid in reducing stress and muscle tension.¹⁵
- **Sub-acute phase:** PMR and mindfulness enhance pain management and decrease central sensitization.⁷
- **Chronic Phase:** Combining relaxation, exercise, and psychological treatments is the best method to adopt in managing the condition.¹⁶

Moreover, relaxation therapy is safe, economical, and easy to administer, making it extremely helpful in treating chronic musculoskeletal pain.¹¹

4.6 Role of Individual Relaxation Techniques

Relaxation strategies in physiotherapy exhibit distinct methods and advantages for managing musculoskeletal pain associated with stress.

The technique of progressive muscle relaxation works best for alleviating muscle tension and increasing blood circulation, which results in pain reduction due to musculoskeletal disorders.⁶

The guided imagery method aids in focusing attention elsewhere and relaxing the mind, thus decreasing the sensation of pain.¹⁴

Mindfulness-based interventions increase present moment awareness and decrease emotional reactivity, thereby increasing pain tolerance and coping strategies.¹⁸

Deep breathing exercises help control the process of respiration and stimulate the parasympathetic nervous system. This leads to lower physiological stress levels.⁵

4.7 Long-Term Benefits and Patient Adherence

Another important factor that comes out strongly from the selected studies is the long-term effectiveness of relaxation techniques.

Regular use of relaxation techniques has been linked with long-term decreases in the severity of pain and stress levels.¹¹

When patients actively participate in self-management practices, such as mindfulness and deep breathing exercises, they exhibit increased compliance with their treatments.¹⁰

Due to the non-invasiveness of these techniques, they are applicable in-home therapy programs, thus improving compliance among patients.¹

Also, these interventions give patients the ability to control their symptoms and hence improve self-confidence without depending heavily on drug therapy.⁴

4.8 Limitations of the Current Evidence

Despite the positive results, several limitations were identified across the included studies.

These differences include varying study designs, sample sizes, and treatment interventions, among others, and these differences make it challenging to make direct comparisons.¹¹

Differences in the time spent on relaxation methods and their frequency also influence the consistency of outcomes observed across studies.¹⁴

Others have used subjective outcome measures like self-report scales for pain and stress that can be biased.³ Furthermore, there are very few randomized controlled studies that address musculoskeletal pain caused by stress, and this emphasizes the necessity for further studies.⁹

4.9 Future Directions for Research

Future research efforts ought to center on developing protocols for using relaxation methods in physiotherapy.

It is necessary to establish an optimal time frame, dosage, and combination of treatments for achieving maximum therapeutic effect.⁸

Additional research must investigate the possible combination of relaxation therapy and modern physiotherapy methods.²⁰

Large-scale randomized controlled trials with long-term follow-up are required to strengthen the evidence base and confirm the sustainability of these interventions.³

Furthermore, future studies must consider the neurophysiological basis of relaxation techniques in understanding their contribution to pain modulation.¹⁹

5. Conclusion

This systematic review confirms that physiotherapy-based relaxation exercises are effective noninvasive methods to manage stress-related musculoskeletal pain. Through the process of combining top-notch studies, one can see that these approaches have positive physiological and psychological impacts that help reduce pain and improve functional abilities.

Findings indicate that methods like progressive muscle relaxation and guided imagery are highly efficient in decreasing muscle tension and enhancing physical functioning, whereas mindfulness-based strategies significantly contribute to controlling central pain sensation and decreasing psychological stress factor.

Moreover, studies have found that when relaxation is combined with other treatment modalities such as physical exercises and cognitive behavioral therapy, the results are better in reducing pain and improving functional abilities and quality of life.

In summary, relaxation exercises not only help deal with the physiological elements of musculoskeletal pain but also with the stress that causes it, which makes them very important to physiotherapy management.

The future research should target the creation of standard protocols for how often, for how long, and which relaxation techniques should be combined in order to improve patient compliance.

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