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Review Article

Physiotherapy as a Pillar of Pain Management in Palliative Medicine

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ABSTRACT

Pain is one of the most prevalent and distressing symptoms in palliative care, affecting physical, psychological, and functional well-being. Physiotherapy offers evidence-based, non-pharmacological strategies that complement medical management and address the multidimensional nature of pain. To summarize and critically evaluate physiotherapy modalities used for pain management in palliative care and describe their mechanisms and clinical applications. A narrative review approach was adopted. Relevant literature published between 2000 and 2025 was searched in PubMed, Scopus, ScienceDirect, Cochrane Library, and Google Scholar. English-language studies involving adult palliative patients and physiotherapy-based pain interventions were included. Data were extracted on study design, population, physiotherapy modality, mechanisms, and outcomes. Quality evaluation used appropriate tools, including Joanna Briggs Institute, the Critical Appraisal Skills Programme, and A Measurement instrument to Assess Systematic Reviews. Thirty-seven key studies formed the final synthesis. Physiotherapy modalities were grouped into functional (exercise, mobilization, positioning), electrotherapeutic (transcutaneous electrical nerve stimulation, scrambler therapy, laser therapy), manual (massage, myofascial release), and mind–body approaches (breathing, relaxation, mirror therapy). Mechanisms of pain relief included peripheral desensitization, spinal modulation through Aβ-fiber activation, cortical reorganization, autonomic regulation, and biomechanical optimization. Physiotherapy is a vital component of holistic pain management in palliative care. By integrating physical, neurological, and psychological mechanisms, physiotherapy complements pharmacological strategies and enhances quality of life. Early interdisciplinary collaboration and continued research are essential to optimize physiotherapy utilization in palliative settings. Collaborative models that include physiotherapists from early stages of disease can enhance quality of life, lessen caregiver stress, and encourage continuity of care.

Key words: Physiotherapy, palliative care, pain management, rehabilitation, quality of life

INTRODUCTION

In palliative care patients, pain is one of the most common symptoms. According to systematic studies, the prevalence of pain in patients with advanced, metastatic, or terminal cancer is around 66.4%, with moderate to severe pain occurring in around 38.0% of cases. [1] As per data from a major national registry, 81% of cancer patients reported pain, compared to 69% of dementia patients, 68% of heart failure patients, 57% of Chronic inflammatory pulmonary disease (COPD) patients, and around 35% of cancer patients who suffered severe pain. [2] These figures emphasize the reality that pain remains a considerable burden for palliative patients, despite advances in symptom treatment.

Palliative medicine specialists seek to enhance quality of life through a comprehensive, interdisciplinary approach by addressing the physical, psychological, social, and spiritual

aspects of pain. This approach views pain as a multifaceted symptom rather than only a sensory one. Such concepts are strongly related to physiotherapy, which is based on functional restoration and patient-centered care. Its objectives are to relieve discomfort, preserve independence, and uphold dignity—strongly align with palliative philosophy. [3]

Pain has many different effects. Psychologically, it causes anxiety, depression, loss of dignity, and a lower quality of life; socially, it affects family/caregiver dynamics and increases caregiver burden; and physically, it causes fatigue, impaired mobility, sleep disturbance, and the incapacity to even perform basic self-care. [4] A tertiary cancer center discovered that approximately 31.5% of referred patients experienced severe pain during their initial visit. [5] According to the research, a substantial number of patients receiving palliative care in India experience excruciating agony. Therefore, it is challenging to downplay the significance of comprehensive, effective pain management strategies. For multidisciplinary palliative care teams, physiotherapy is a crucial but under-appreciated alternative. Enhancing circulation, reducing muscular tension and spasm, improving endorphin release and neuromodulation, avoiding deconditioning, and maintaining functional independence are just a few of the ways that physiotherapy helps. [6] Therapeutic exercise, manual massage, electrotherapy (e.g., transcutaneous electrical nerve stimulation [TENS]), thermotherapy (heat/cold), positioning and mobility assistance, and breathing/relaxation techniques are examples of modalities that can be used in a palliative setting. [7]

Given this, it is essential to provide an overview of what is presently understood about the role of physiotherapy in pain management within palliative care, including what therapies are available, how they could work, and the supporting data. This is especially crucial in places like India, where a lack of resources, labor scarcity, delayed referrals, and a lack of knowledge about the role of physiotherapy in palliative care may make integration difficult.

The purpose of this narrative review is to examine how physiotherapy and palliative care work synergistically to manage pain. It aims to summarize the therapeutic and physiological processes by which physiotherapy reduces pain, examine the currently available evidence supporting physiotherapy interventions in palliative populations, and discuss effective strategies for multidisciplinary integration. The study highlights the complementary relationship between physiotherapy and palliative medicine in achieving the shared goal of comprehensive pain management.

METHODOLOGY

This study uses a narrative review methodology to investigate the use of physiotherapy for pain management in palliative medicine. The narrative method was chosen because it allows for a comprehensive synthesis of data from many study types, including reviews, expert consensus, quantitative research, and qualitative investigations, and it integrates conceptual and clinical viewpoints relevant to both disciplines.

Search Strategy

A broad literature search was conducted in the following databases: PubMed, Scopus, ScienceDirect, Google Scholar, and Cochrane Library, covering publications from January 2000 to September 2025. The search used a combination of Medical Subject Headings (MeSH) and free-text terms such as: "palliative care," "physiotherapy," "pain management," "rehabilitation," "TENS," "manual therapy," "exercise therapy," "quality of life," and "integrated care."

Boolean operators "AND" and "OR" were applied to combine terms (e.g., "palliative care" AND "physiotherapy," "pain" AND "rehabilitation," etc.). The reference lists of retrieved articles were also screened to identify additional relevant studies.

Studies Were Chosen Using the Inclusion Criteria Listed Below

The study must have been published in English between 2000 and 2025, explored physiotherapy or physical rehabilitation methods targeted at improving quality of life or reducing pain, and focused on patients receiving palliative or end-of-life care. Only reviews, clinical recommendations, or original research (such as cohort studies, cross-sectional studies, or randomized controlled trials [RCTs]) were considered. Studies that addressed rehabilitation unrelated to pain management (such as cardiopulmonary or neurological rehabilitation in early-stage disease) or that were conference abstracts, commentaries, or non-peer-reviewed sources lacking primary data were excluded.

Data Extraction and Synthesis

The data extraction process followed a structured but flexible approach appropriate for narrative synthesis. Each eligible article was reviewed in full and summarized using a standardized data extraction form developed for this review. Extracted data included:

Bibliographic details: Author(s), year, country, and publication type.

Study characteristics: Design (RCT, cohort, observational, or qualitative), setting (hospital, hospice, home care), and sample size.

Participant profile: Diagnosis, disease stage, and baseline functional level.

Intervention details: Type of physiotherapy (exercise, manual therapy, TENS, relaxation, etc.), duration, frequency, and combination with pharmacologic care.

Outcome measures: Pain assessment scales (VAS, Numerical rating scale (NRS), Brief pain inventory (BPI)), functional scores (Barthel Index, Karnofsky), or quality-of-life indicators (European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 15 Palliative Care (EORTC QLQ-C15-PAL), McGill Quality of life questionnaire (McGill QoL)).

Results and conclusions: Main findings related to pain reduction, functional improvement, and psychological outcomes.

Level of evidence and limitations: As stated by the authors or inferred through critical reading.

Extracted Data Were Then Grouped into Three Thematic Domains to Facilitate Interpretation

Physical and functional outcomes: For example, mobility, posture, muscle tone, and energy conservation.

Psychological and quality-of-life outcomes: For example, mood, self-efficacy, and participation.

Interdisciplinary integration: Models of collaboration between physiotherapists and palliative physicians.

Given the heterogeneity of study designs and outcomes, meta-analysis was not attempted. Instead, results were synthesized narratively, emphasizing recurring findings, intervention feasibility, and contextual insights relevant to clinical practice.

A total of 543 records were identified through database searches. After removing duplicates and screening titles/abstracts, 164 full-text articles were reviewed for eligibility. Seventy-seven studies met the inclusion criteria and informed the synthesis. Of these, 37 representative and high-quality references were cited in the final manuscript to support the main findings. **Figure 1** shows the literature review process.

Quality Assessment

Each included study's quality was critically assessed using recognized appraisal instruments pertinent to its design in order to guarantee methodological rigor. The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for RCTs was used for RCTs, with an emphasis on the validity of outcome measurements, blinding techniques, attrition handling, and adequate randomization. The JBI Checklist for Cohort Studies was used to evaluate observational and cohort studies, with a focus on sample comparability, exposure measurement accuracy, and confounding control.

The AMSTAR-2 instrument (A Measurement instrument to Assess Systematic Reviews) was used to assess the presence of a registered procedure, the thoroughness of the literature search, the suitability of bias assessment, and the transparency of synthesis methodologies for systematic reviews and meta-analyses. Lastly, the Critical Appraisal Skills Programme (CASP) Qualitative Checklist was used to analyze qualitative and mixed-methods research, evaluating the findings' dependability, confirmability, transferability, and credibility.

Based on these standards, a qualitative rating of good, moderate, or low quality was given to each study. Reviewers' disagreements were settled by dialogue until a consensus was reached. Lower-quality studies were kept for conceptual completeness, but in order to preserve openness and interpretative balance, their methodological shortcomings were noted in the discussion.

RESULT AND DISCUSSION

Pain in palliative care is diverse, including physical, psychological, social, and spiritual dimensions. It restricts movement, freedom, and engagement in day-to-day activities in addition to affecting comfort. [7] According to

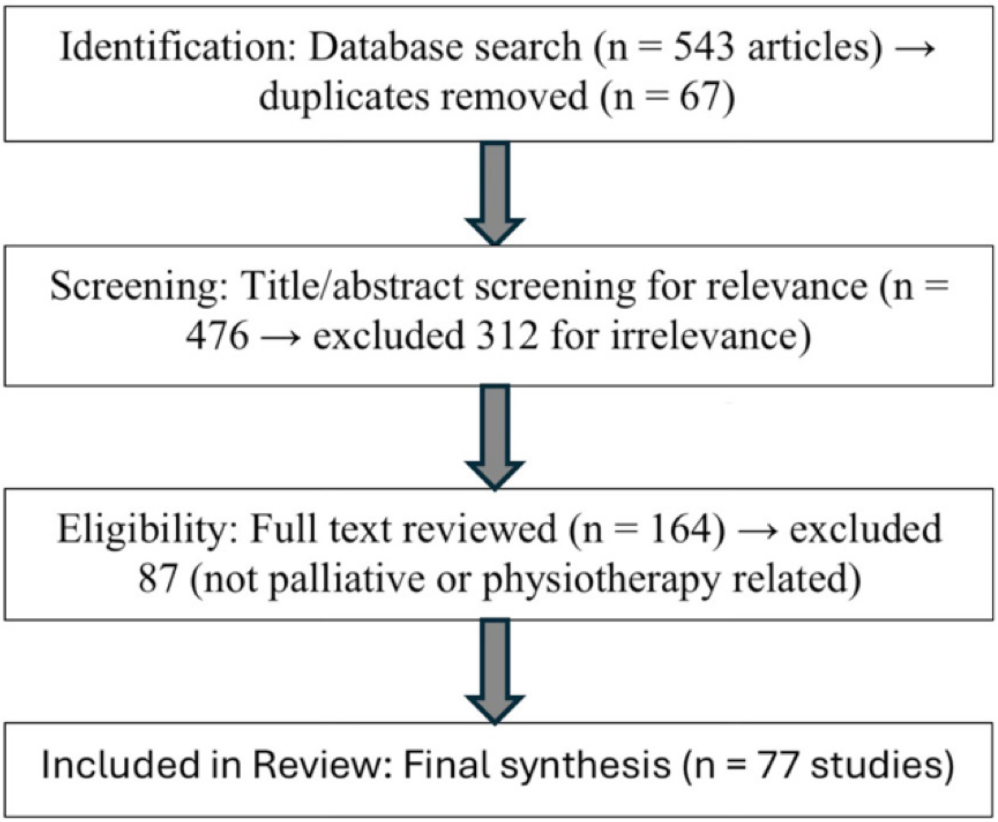

Figure 1: Flow chart for literature review.

the World Health Organization (WHO), pain management should be comprehensive, taking into account both the physical and psychological effects of suffering. [8] Addressing pain through physical, neuromuscular, and psychological mechanisms, physiotherapy enhances rather than replaces pharmaceutical methods in an all-encompassing strategy. [9]

Palliative medicine is a multidisciplinary field that uses pharmacologic, psychological, and rehabilitative therapies to improve quality of life. Physiotherapy enhances this framework by encouraging functional independence, lowering pain through neuromuscular and biomechanical pathways, and improving psychological comfort. [6, 9] Palliative patients frequently have functional decline, which frequently makes pain worse because of stiffness, postural strain, and inactivity. Even in later stages of illness, early physiotherapy intervention can prevent these secondary pain mechanisms and preserve autonomy. [6, 10]

Physiotherapy is included in palliative care with an emphasis on maintaining dignity and engaging in meaningful activities in addition to providing pain relief. [6] The idea of "rehabilitation in reverse," in which the therapeutic objective shifts from recovering full function to maximizing comfort, safety, and independence as disease advances, encapsulates this synergy. [11]

Physiotherapy Modalities in Pain Management

To restore mobility, enhance circulation, regulate brain activity, and lessen psychological suffering, physiotherapy interventions focus on both nociceptive and neuropathic processes of pain. Exercise therapy, manual therapy, TENS, thermotherapy, positioning, and relaxation techniques are the main modalities utilized in palliative pain management. **Table 1** includes different mechanisms of pain modulation by Physiotherapy intervention. **Figure 2** presents the different mechanisms of pain modulation by Physiotherapy.

Exercise and Movement Therapy

Mechanism: Exercise stimulates endogenous endorphin release and activates descending inhibitory pain pathways involving serotonin and norepinephrine. [11] It also improves joint lubrication, muscle elasticity, and proprioceptive input, thereby reducing nociceptive signaling. [7]

Clinical use: Exercise therapy is indicated for ambulatory or semi-ambulatory palliative patients with manageable fatigue and pain. It is effective in cancer-related pain, neurodegenerative conditions (Amyotrophic Lateral Sclerosis (ALS), Parkinson's disease, Multiple sclerosis (MS)), and chronic organ failure syndromes. Passive or assisted exercises are used for bedridden or frail patients. [10]

Effectiveness: Oldervoll et al. demonstrated that an eight-week supervised exercise program significantly improved pain interference, fatigue, and mood in advanced cancer patients. [11] Bausewein et al. confirmed that consistent low-intensity movement therapy reduced pain intensity by 15%–25% and improved quality of life scores. [12]

Table 1: Mechanisms of pain modulation by physiotherapy interventions.

Mechanistic level	Representative techniques	Mechanism of pain modulation
Peripheral (tissue/ cellular level)	Low-level laser therapy, dry needling	• Photochemical activation of mitochondrial cytochrome c oxidase → ↑ ATP and nitric oxide release • Vasodilation, improved oxygenation, and lymphatic flow • ↓ Pro-inflammatory cytokines (Tumour necrotic factor alpha (TNF-α), Interleukins 1beta (IL-1β)) and ↓ oxidative stress • ↓ Peripheral sensitization of nociceptors
Spinal (segmental modulation)	TENS, manual therapy, thermotherapy	• Activation of large-diameter A-β fibers → inhibition of A-δ and C fibers (Gate Control Theory) • Modulation of dorsal horn interneurons and neurotransmitter release • ↓ Nociceptive transmission at the spinal level
Supraspinal/ cortical (central neuromodulation)	Scrambler therapy, mirror therapy, Transcranial direct current stimulation (tDCS)	• Scrambler: substitutes pain signals with synthetic "non-pain" information via cutaneous electrodes → cortical reprogramming and desensitization • Mirror Therapy: visual–motor illusion reorganizes maladaptive cortical maps, restoring normal sensory-motor representation • tDCS: modulates cortical excitability and descending inhibitory control pathways
Psychological/ cognitive-emotional	Relaxation, breathing exercises, and massage	• Cognitive distraction, ↓ limbic activation, ↑ parasympathetic tone • ↓ Anxiety and muscle tension • Enhances coping and perceived control over pain
Functional/ biomechanical	Exercise therapy, positioning, and mobilization	• Improves joint mobility, posture, and circulation • Prevents stiffness and contractures • Enhances proprioceptive feedback → ↓ nociceptive input

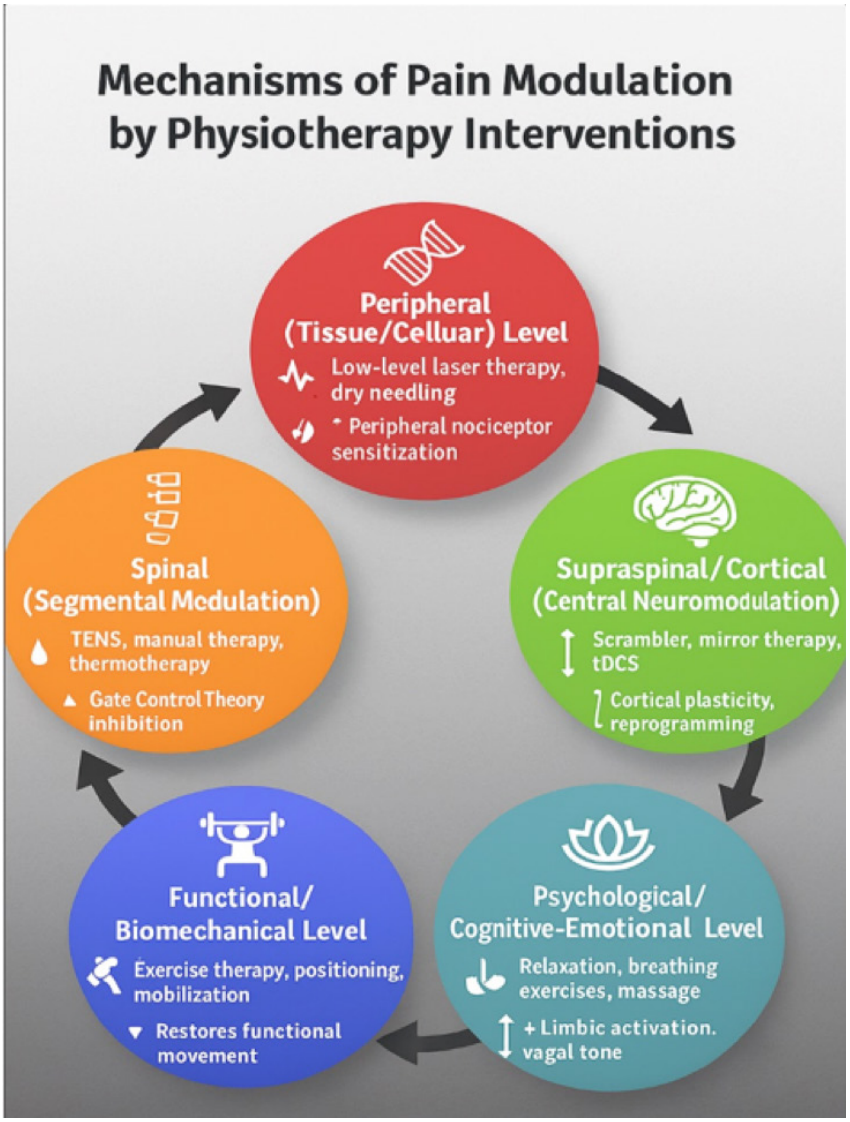

Figure 2: Multilevel mechanisms of pain modulation by physiotherapy.

Manual Therapy and Massage

Mechanism: Massage stimulates mechanoreceptors that inhibit nociceptive transmission at the dorsal horn (Gate Control Theory), promotes circulation, and reduces muscle spasm. [13] It also activates parasympathetic pathways, lowering cortisol and stress-related pain. [14]

Clinical use: Suitable for myofascial, musculoskeletal, and postural pain, shoulder or back stiffness, and terminal restlessness. Contraindications include bony metastases, Deep vein thrombosis (DVT), open wounds, and skin lesions. [6]

Effectiveness: Kozak et al. [13] found that massage reduced Visual analogue scale (VAS) pain by 2.3 points and improved relaxation in hospice patients. Jane et al. [15] showed that regular 20-minute massages improved comfort and sleep quality. Kutner et al. [16] reported significant pain and mood improvements in advanced cancer patients, confirming massage as a safe and patient-preferred method of pain relief.

Transcutaneous Electrical Nerve Stimulation (TENS)

A non-invasive analgesic method called TENS stimulates peripheral sensory nerves to control pain transmission by applying moderate electrical impulses to the skin via surface electrodes. Many physiological processes that function at the peripheral, spinal, and supraspinal levels produce the analgesic effect:

Gate control theory: The gate control theory, which was presented by Melzack and Wall in 1965, explains how TENS stimulation of large-diameter A-β fibers prevents nociceptive input from small-diameter A-δ and C fibers in the spinal cord's dorsal horn. By "closing the gate" to pain transmission, fewer nociceptive signals are able to reach higher brain regions. **Figure 3** shows the diaphragm of the Gate control theory. [14, 17]

***Endogenous opioid release*:** The periaqueductal gray matter and nucleus raphe magnus release β-endorphins and enkephalins in response to low-frequency TENS (1–4 Hz, high intensity), which trigger descending inhibitory pathways. [18] To reduce pain without changing the sensitivity of opioid

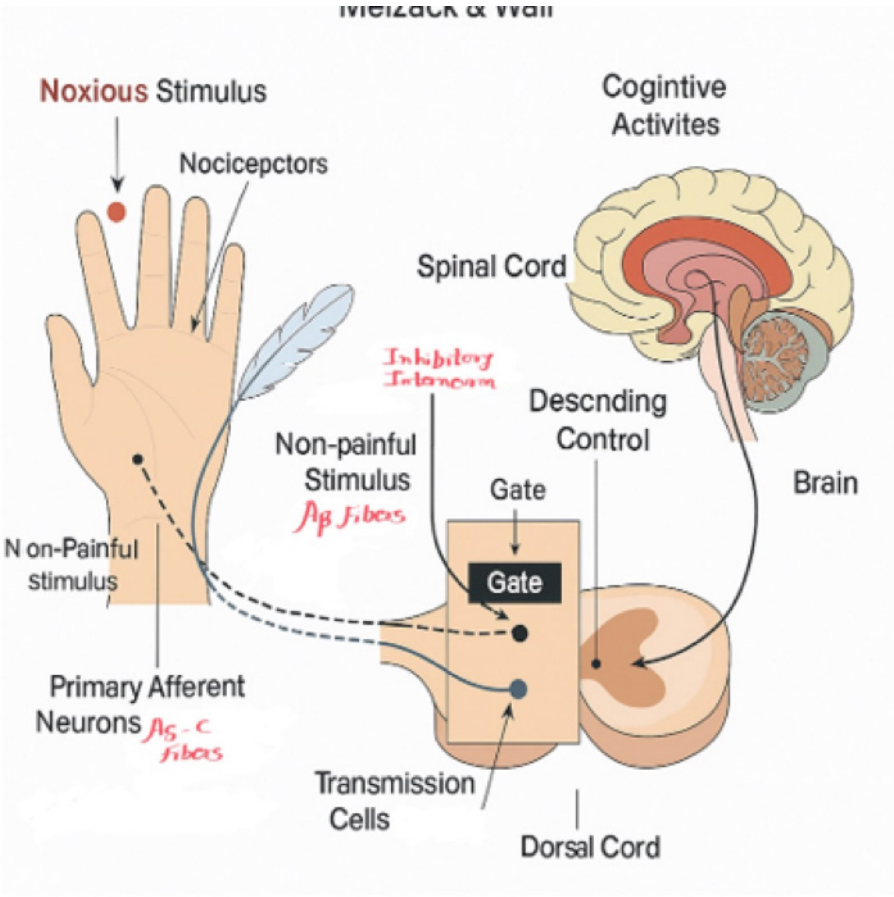

Figure 3: Gate control theory of pain (adapted from Melzack and Wall, 1965).

receptors, high-frequency TENS (80–100 Hz) mainly targets GABAergic interneurons in the spinal cord. [19]

Peripheral Mechanisms: TENS improves tissue repair and lessens ischemic discomfort by increasing local microcirculation and oxygenation. Additionally, it contributes to peripheral desensitization by reducing the release of inflammatory mediators such as substance P and bradykinin. [20]

Autonomic effect: Sympathetic overactivity, which is frequently increased in terminal anxiety and chronic pain, may be lessened by TENS. [21] It improves comfort, mood, and perceived self-efficacy by giving patients more control over their pain, all of which indirectly reduces pain severity. [22]

Adhesive surface electrodes are placed on clean, dry skin over or close to the painful area or matching dermatomes in order to apply TENS. To improve contact, the patient is placed in a comfortable position, and their skin is cleaned with proper technique. The device is turned on with parameters chosen according to the kind of pain, usually high-frequency (80–100 Hz) for acute pain or low-frequency (1–4 Hz) for chronic or neuropathic pain. Electrodes are positioned at least 2 to 3 cm apart. The intensity is progressively increased until the patient experiences either a little muscle twitch (for low-frequency) or a strong yet comfortable tingling sensation without muscular contraction (for high-frequency). Usually lasting 20 to 40 minutes, treatment can be repeated one to three times a day, depending on how well the patient responds. After the session, electrodes are removed, the skin is checked for irritation, and pain intensity is reassessed. [5]

Thermotherapy (Heat and Cold Applications)

Mechanism: Heat reduces muscle spasm, enhances blood flow, and increases tissue flexibility. Cold causes analgesia, lowers inflammation, and slows nerve conduction velocity. [23] It should be avoided in poor circulation, hyperalgesia, or sensory loss. Application of heat therapy should be avoided directly to the surface area of the tumor. For patients with a transdermal patch for pain management, heat therapy should be used cautiously, as heat application is associated with increased dose release and absorption.

Clinical use:

- Heat: indicated for chronic musculoskeletal pain, joint stiffness, and muscle tightness.
- Cold: for acute inflammation or localized tumor pain. [6]

Effectiveness: Hitt et al. [23] found that heat therapy decreased pain scores and promoted relaxation, while cold compresses reduced inflammation and post-radiation discomfort. These simple methods can be safely used in home-based palliative care.

Breathing Techniques

Both physiological and psychological channels are used by breathing techniques to control pain. By stimulating the parasympathetic nerve system (vagal tone), slow diaphragmatic breathing lowers heart rate, sympathetic arousal, and tense muscles. [24] As a result, anxiety and pain perception are reduced. Additionally, controlled breathing maximizes oxygenation and lessens panic brought on by dyspnea, which otherwise amplifies pain signals through limbic activation. [9] Furthermore, rhythmic breathing reduces cortical pain processing and increases endorphin release, creating a relaxing impact that improves comfort and coping. [25]

Types of Breathing Techniques in Palliative Care

- Diaphragmatic (abdominal) breathing
- Pursed-lip breathing (especially for dyspnea)
- Slow-paced breathing (4–6 breaths/min)
- Box breathing (4–4–4–4 seconds pattern)
- Mindful breathing with relaxed exhalation
- Breathing paired with visualization or guided imagery

Biofeedback Mirror Therapy and Graded Motor Imagery

Mechanism: Modulates cortical reorganization and sensory-motor integration to reduce neuropathic and phantom pain.

Clinical use:

- Post-amputation pain
- Chemotherapy-induced neuropathy
- Stroke and neurological involvement in cancer

Effectiveness: It has shown a 25% to 45% reduction in neuropathic pain and improved limb awareness in chronic pain populations. [26]

Myofascial Release and Instrument-Assisted Soft Tissue Mobilization (IASTM)

Mechanism: Targets fascial adhesions, improving mobility, reducing nociceptive input, and enhancing lymphatic and blood flow. [27]

Clinical use:

- Cancer-related myofascial pain
- Post-radiotherapy fibrosis
- Lymphedema-related discomfort

Dry Needling

An invasive physical therapy method called dry needling is used to relieve tense bands, deactivate myofascial trigger points, and lessen nociceptive input. In order to enhance muscle perfusion, restore normal motor end-plate activity, and reduce peripheral and central sensitization, a thin, sterile filament needle is introduced into perceptible trigger sites. This causes a local twitch response. [28] Dry needling may help cancer patients receiving palliative care who have myofascial pain from immobility, treatment-related muscular tightness, or post-radiation fibrosis. To improve comfort, sessions usually include mild insertion and quick stimulation (10–30 seconds per location) with little needle movement. But it's crucial to choose patients carefully, away from regions with tumors, lymphedema, thrombocytopenia, infection risk, or bleeding tendencies associated with anticoagulation. [29] While evidence in oncology rehabilitation shows promising pain relief and improved mobility, its direct use in advanced palliative patients remains limited and should be implemented only by trained clinicians with oncology experience. [30]

Low-Level Laser Therapy (LLLT)

LLLT, often referred to as photobiomodulation, modulates cellular activity, enhances tissue healing, and lessens pain and inflammation by using low-intensity red or near-infrared light. By increasing cytochrome-c oxidase activity, Adenosine triphosphate (ATP) generation, nitric oxide release, and anti-inflammatory cytokines, photonic energy received by mitochondria improves microcirculation and produces analgesia. [31] In clinical settings, LLLT is used to treat pressure sore pain, neuropathic pain, radiation-induced fibrosis, lymphedema discomfort, and orofacial pain associated with mucositis. [32] Depending on energy parameters (usually 2–10 J per site), the probe is applied to the afflicted regions or acupuncture sites for 30 seconds to 2 minutes each. Patient with mucositis, time may vary up to 5 minutes. Although LLLT is well-tolerated, pleasant, and safe for weak people, it shouldn't be applied to active tumor tissue unless a specific oncologic strategy is in place. [33]

Scrambler Therapy

Scrambler treatment is a non-invasive neuromodulation method that uses surface electrical stimulation to substitute artificial "non-pain" information for chronic pain signals. In contrast to TENS, it delivers changing frequency and intensity waveforms that encode "normal" sensory information to disrupt neuropathic pain circuits by directly targeting C-fibers and A-delta fibers via cutaneous electrodes. [34] Usually lasting 30 to 45 minutes each day for five to ten sessions, electrodes are positioned close to and along the dermatome of the painful area rather than directly over the pain spot. [35] Chemotherapy-induced peripheral neuropathy, post-surgical neuropathic pain, post-herpetic neuralgia, and cancer-related neuropathic pain have all benefited greatly from scrambler treatment, with several trials reporting quick and long-lasting relief. [36, 37] It is helpful when pharmacologic neuropathic medicines induce drowsiness or GI intolerance, are well-tolerated, and are safe for frail people. Limitations include cost, device availability, and the need for trained providers, but evidence suggests a meaningful benefit in palliative neuropathic pain where conventional options fail. **Table 2** summarizes the different modalities of Physiotherapy with their mechanisms.

Physiotherapy provides a complete, multifaceted contribution to pain treatment in palliative care, according to the evaluated data. Physiotherapy treats both peripheral and central processes of pain using a variety of modalities, from traditional exercise and manual treatment to contemporary neurophysiological techniques like TENS, laser therapy, and scrambler stimulation. In addition to relieving discomfort, these approaches maintain function, lessen drug dependence, and improve emotional health.

Table 2: Different modalities of physiotherapy.

Modality	Mechanism of action	Indications/target conditions	Effectiveness /evidence summary	Precautions	Level of evidence
Exercise therapy	Endorphin release, improved circulation, neuromuscular reactivation	Cancer pain, fatigue, immobility	↓ Pain 15%–25%, ↑ QoL, and mood [11]	Avoid overexertion, fatigue	RCTs
Manual therapy/ massage	Gate control, muscle relaxation, parasympathetic activation	Myofascial, postural, anxiety-related pain, Incisional pain	↓ VAS 2–3 points, improved sleep [13]	Avoid application over bony mets, DVT, skin lesion	RCTs, Clinical trials
TENS	Gate control, endorphin release, and improved local circulation	Neuropathic, musculoskeletal, post-surgical, Incisional pain	↓ Pain 20%–40%, safe, well tolerated [18]	Consider a cardiologist's opinion on pacemakers, open wounds	RCTs, Systematic review
Thermotherapy (heat/cold)	Heat: ↑ blood flow, ↓ spasm; Cold: ↓ inflammation	Chronic muscle or joint pain, inflammation	Mild–moderate pain relief; improved comfort	Avoid poor sensation, wounds	Expert opinion
Breathing and relaxation	Parasympathetic activation, ↓ anxiety	Dyspnea, anxiety, terminal pain	↓ Pain and anxiety [24]	Avoid hyperventilation	Clinical trial
Mirror therapy	Cortical reorganization, sensory-motor integration	Phantom limb, neuropathic pain	↓ Pain, improved limb perception (Moseley, 2007)	Visual discomfort	RCTs, experimental study
Dry needling	Trigger point deactivation, ↑ perfusion	Myofascial, radiation-induced fibrosis	Pain reduction, mobility gain [30]	Avoid tumors, low platelets	Case series
Low-level laser therapy	ATP upregulation, anti-inflammatory, improved microcirculation	Oral mucositis, fibrosis, neuropathy	↓ Pain, faster healing [31]	Avoid direct tumor irradiation	Systematic reviews
Scrambler therapy	Replaces pain signals with "non-pain" information	Neuropathic, Chronic inflammatory polyneuropathy (CIPN), post-surgical pain	Sustained ↓ pain intensity (Smith et al., 2020) [37]	Device availability	RCTs

Future Directions and Research Implications

The majority of research on physiotherapy in palliative pain management is small-scale, diverse, and concentrates on cancer patients, despite mounting evidence to the contrary. Large, well-planned studies examining multimodal physiotherapy combinations, cost-effectiveness, and long-term results should be given top priority in future research. The accessibility of home and community-based treatment can be increased by integrating digital and tele-rehabilitation technologies. Collaborative models that include physiotherapists from the early stages of the disease may enhance quality of life, lessen caregiver stress, and encourage continuity of treatment.

CONCLUSIONS

In the comprehensive management of pain in palliative care, physiotherapy is an essential and developing component. Physiotherapy is in perfect harmony with the palliative concept, which aims to alleviate pain while maintaining autonomy and dignity by treating the functional, psychological, and physical elements of suffering. While more recent methods like mirror therapy, laser treatment, and scrambler stimulation broaden the therapeutic range through neuromodulatory and non-pharmacologic processes, traditional modalities like exercise, posture, and TENS remain essential. Physiotherapy improves mobility, happiness, and quality of life in addition to reducing pain when it is incorporated early in multidisciplinary treatment. Future initiatives should concentrate on creating organized recommendations, creating a physiotherapy curriculum tailored to palliative care, and carrying out thorough clinical trials to confirm long-term advantages.

AUTHORS' CONTRIBUTION

All authors have significantly contributed to the work, whether by conducting literature searches, drafting, revising, or critically reviewing the article. They have given their final approval of the version to be published, have agreed with the journal to which the article has been submitted, and agree to be accountable for all aspects of the work.

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CONFLICT OF INTEREST

None.

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