

Role of Physiotherapy in the Management of Non-Cardiac Chest Pain: A Narrative Review

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Publication Date: 2026/10/05

Abstract:

➤ *Background:*

Non-cardiac chest pain (NCCP) is a heterogeneous clinical presentation in which chest pain persists despite the absence of an identified cardiac cause after appropriate medical evaluation. The underlying contributors may be musculoskeletal, vascular, neurological, respiratory, gastrointestinal, psychological, or a combination of these mechanisms.

➤ *Objective:*

To synthesize the available evidence regarding physiotherapy and rehabilitation approaches used for NCCP and NCCP-like presentations across musculoskeletal, vascular, neurological, respiratory, and gastrointestinal/psychological contributors.

➤ *Methods:*

A narrative review was developed from the supplied NCCP evidence set comprising 18 articles published between 1993 and 2026. The evidence included randomized controlled trials, prospective studies, case reports, systematic reviews, a systematic review and meta-analysis, narrative reviews, and a trial protocol. Findings were organized thematically according to the major clinical contributors to NCCP.

➤ *Results:*

Musculoskeletal studies reported benefits from selected manual therapy, heat, stretching, trigger-point-oriented interventions, and functional restoration, although long-term comparative superiority over self-management was inconsistent. Thoracic outlet syndrome literature supported postural correction, stretching, scapular stabilization, neural mobilization, exercise, taping, and technology-assisted rehabilitation, although protocols were heterogeneous. Cervical angina literature emphasized recognition of cervical pathology and conservative management, but direct physiotherapy trials were limited. Respiratory rehabilitation, including aerobic and inspiratory muscle training, showed promising findings

in NCCP accompanied by dyspnea. Diaphragmatic breathing, relaxation, and dynamic neuromuscular stabilization were also investigated in gastrointestinal and psychological NCCP.

➤ **Conclusion:**

The reviewed evidence supports a mechanism-oriented, individualized, and multidisciplinary approach to NCCP rather than a universal physiotherapy protocol. Better diagnostic phenotyping, standardized intervention reporting, adequately powered trials, clinically relevant outcomes, and longer follow-up are needed to strengthen the evidence base.

Keywords: *Non-Cardiac Chest Pain; Physiotherapy; Physical Therapy; Musculoskeletal Chest Pain; Thoracic Outlet Syndrome; Cervical Angina; Respiratory Rehabilitation; Diaphragmatic Breathing; Rehabilitation.*

How to Cite: Dr. Pooja Gurudasani; Dr. Ashlesha Mankar; Dr. Sachin Tendulkar; Dr. Amit Jaiswal; Dr. Aastha Patel; Dr. Sudesh Waydande; Dr. Priyanka Ghumnani (2026) Role of Physiotherapy in the Management of Non-Cardiac Chest Pain: A Narrative Review. *International Journal of Innovative Science and Research Technology*, 11(9), 2703-2712.
<https://doi.org/10.38124/ijisrt/26sep1378>

I. INTRODUCTION

Non-cardiac chest pain (NCCP) refers to chest pain with a distribution similar to that of cardiac pain that is not caused by an identifiable cardiac abnormality after a thorough clinical evaluation. [1] Although non-cardiac chest pain is not associated with an acute cardiac event, the similarity of its symptoms to angina can cause significant concern for both patients and healthcare professionals leading to multiple medical consultations and investigations.[2]

NCCP is a heterogeneous and multifactorial clinical presentation. There may be contributions from gastrointestinal, musculoskeletal, respiratory, psychological and functional comprehensive assessment and management. [1,2] Gastroesophageal reflux disease (GERD) is recognized as one of the most common causes of NCCP, and reflux-associated chest pain may be difficult to distinguish clinically from cardiac chest pain. [3,4] Musculoskeletal causes of NCCP may arise from dysfunctions of the chest wall, cervical and thoracic spine, ribs, and the related musculature and soft tissue. [5,6] These different possible origins underline the importance of a broad clinical assessment and not only focused on the GI or cardiovascular system. [1,5]

The NCCP experience may go beyond the mere existence of pain itself. Recurrent chest pain may be related to limitations on physical activity, psychological distress, diminished confidence during physical exertion, and diminished quality of life. [2,7,8] In some people symptoms may persist despite appropriate medical management of the suspected underlying condition. [7,8] Persistent symptoms may involve multiple interacting factors including musculoskeletal dysfunction, altered breathing patterns, physical deconditioning, psychological factors and increased attention to bodily symptoms. [1,7,8]

Treatment of NCCP generally includes determining and treating the underlying cause, with treatment directed at the specific gastrointestinal, musculoskeletal, respiratory or psychological contributor when found. [3,4,5] However, a disease specific approach may not sufficiently address the physical impairments and functional limitations experienced by some patients. [7,8] Therefore, multidisciplinary and non-pharmacological approaches that could supplement the

standard medical treatment have gained increasing interest. [7,9]

A physiotherapy intervention in a multidisciplinary NCCP management plan may involve the identification and treatment of potential physical impairments and functional impairments that may be modifiable in an NCCP patient. [6,7] Depending on the presenting problems, physiotherapy intervention may involve manual therapy, therapeutic exercise, exercises for thoracic and cervical mobility, postural correction, breathing exercises, relaxation exercises, physical activity and patient education. [6,7,9-13] These elements may be used to improve the movement-related pain and disturbances in musculoskeletal range of motion, respiratory function, muscle tension and lack of physical capacity. [6,7,13] The evidence for physiotherapy treatment of NCCP in terms of clinical presentation is, however, somewhat less clear and is spread across clinical presentations of the following: musculoskeletal chest pain, respiratory dysfunction and, GERD related chest pain. [7,9,14] Having a better understanding of this evidence may assist the physiotherapist in identifying suitable patients, providing relevant interventions, and working within a team.

➤ **Aim and Objectives**

- Aim: To synthesize and interpret the available evidence regarding physiotherapy management of NCCP across major musculoskeletal, neurovascular, neurological, respiratory, and gastrointestinal/psychological contributors.
- ✓ To synthesize evidence regarding physiotherapy management of NCCP across major clinical contributors.
- ✓ To describe underlying mechanism physiotherapy interventions and rehabilitation strategies evaluated in the available literature.
- ✓ To identify clinical implications and priorities for future physiotherapy research.

II. MATERIALS AND METHODS

➤ Data Sources:

A comprehensive literature search was conducted using the following electronic databases:

- PubMed / MEDLINE
- Google Scholar
- Scopus
- Cochrane Library
- PEDro (Physiotherapy Evidence Database).
- Web of Science

➤ Search Strategy:

A structured search strategy was used to identify relevant literature. Key terms were combined using Boolean operators (AND, OR) to maximize sensitivity. The following keywords were used in various combinations:

“Non-cardiac chest pain” OR “noncardiac chest pain” OR “NCCP” OR “atypical chest pain” OR “non-cardiac chest discomfort”

“Physiotherapy” OR “physical therapy” OR “physiotherapeutic intervention” OR “rehabilitation” OR “manual therapy” OR “therapeutic exercise” OR “exercise therapy” OR “breathing exercises” OR “inspiratory muscle training” OR “respiratory physiotherapy”

“Musculoskeletal chest pain,” “chest wall pain,” “cervical spine,” “thoracic spine,” “gastroesophageal reflux disease,” “GERD,” “pain,” “quality of life,” “physical function,” “respiratory function,” and “functional outcomes.”

➤ Inclusion Criteria-

Studies were included in the review if they met the following criteria:

- Participants were adults diagnosed with Non- Cardiac Chest pain
- The study investigated the effects of physiotherapy management in NCCP.
- Study designs included randomized controlled trials, quasi-experimental studies, cohort studies, pilot studies, systematic reviews, and meta-analyses
- Articles published in the English language
- Full-text articles available

➤ Exclusion Criteria

Studies were excluded if they met any of the following criteria:

- Participants with cardiac chest pain
- Focused exclusively on pharmacological or surgical interventions
- Conference abstracts, posters, editorials, or opinion pieces without full-text availability
- Articles not published in English

➤ Article Selection Process

The selection process occurred in three stages:

- Title screening: All retrieved articles were screened based on their titles to remove clearly irrelevant studies.
- Abstract screening: Abstracts of potentially relevant articles were reviewed to assess eligibility based on the inclusion and exclusion criteria.
- Full-text review: Full texts of selected articles were read in detail to confirm relevance and to extract key information.

➤ Search Concepts

The evidence set represented the following concepts in different combinations: non-cardiac chest pain, chest pain, physiotherapy, physical therapy, rehabilitation, manual therapy, exercise therapy, cervical angina, thoracic outlet syndrome, respiratory training, inspiratory muscle training and diaphragmatic breathing.

➤ Data Extraction and Data Synthesis

Data were extracted including publication year, study characteristics, participant profile, clinical condition, physiotherapy intervention, outcome measures, key findings, and conclusions. The evidence was organized into major clinical domains, including musculoskeletal, vascular/neurovascular, neurological, respiratory, and gastrointestinal/psychological contributors to NCCP. Findings were synthesized thematically, focusing on intervention characteristics, clinical context, outcomes, and study limitations.

III. RESULTS

➤ Characteristics of the Evidence Base

Eighteen articles published between 1993 and 2026 were included in the narrative synthesis. The evidence comprised randomized controlled trials, prospective studies, case reports, systematic reviews, a systematic review and meta-analysis, narrative reviews, and a trial protocol. The literature covered five clinically relevant domains: musculoskeletal chest pain, TOS, cervical angina, respiratory NCCP, and gastrointestinal/psychological NCCP. The largest concentration of direct physiotherapy evidence was found in musculoskeletal chest pain and TOS, while cervical angina and respiratory NCCP were represented by more limited clinical evidence.

Table 1 Summary of the Included Evidence

Author (Year)	Study Design	Sample/ Population	Intervention	Duration	Outcome Measures	Key Findings
Japa et al., 2026	Narrative review	Literature review on cervical angina	Conservative physiotherapy	Not reported	Clinical presentation; neurological findings; cervical pathology; treatment response	Cervical spine disorders can produce angina-like chest pain; recognition is important after cardiac causes are excluded.
Joshi et al., 2026	Systematic review	TOS studies; population varies	Postural correction; stretching; scapular stabilization; neural mobilization; rehabilitation	Not reported	Pain; upper-limb function; strength; disability; functional capacity	Structured physiotherapy was associated with reductions in pain and improvements in upper-limb function, although protocols were heterogeneous.
Elshinnawy et al., 2026	RCT	40 adults with TOS	Osteopathic/physical therapy-based intervention	Not reported	Pain; respiratory parameters; inspiratory muscle-related measures	Investigated the effects of an osteopathic/physical therapy-based intervention on pain and respiratory parameters in TOS.
Suryavanshi et al., 2025	RCT	88 NCCP subjects	Diaphragmatic breathing + Jacobson relaxation + DNS + pharmacological treatment	4 weeks	BDI; HDRS; GERD questionnaire; NPRS	Both groups improved; significantly greater reductions in GERD-related symptoms and pain were reported in the intervention group after 4 weeks.
Şengül & Şengül, 2024	RCT	50 NCCP patients with pectoralis trigger points	Stretching exercises; additional pectoralis trigger-point injection in one group	Not reported	VAS pain; Nottingham Health Profile	Trigger-point injection plus stretching produced greater pain reduction than stretching alone; no significant between-group difference in quality-of-life outcome.
Goharinejad et al., 2024	RCT	88 patients with disputed TOS	Mobile application-based rehabilitation/self-management	Not reported	Pain; disability/function	Technology-assisted rehabilitation was evaluated for reducing pain and disability and was associated with improvement in

						selected outcomes.
Huzmeli & Yildiz Ozer, 2023	Case report	38-year-old man with NCCP and dyspnea	Aerobic training + IMT at 30% MIP	6 weeks; ≥ 5 days/week	Respiratory muscle strength; 6MWT; dynamometry; spirometry; fatigue; MMRC; Borg; IPAQ; SF-36; HADS	Functional capacity, physical activity, pulmonary function, and respiratory/peripheral muscle strength improved; dyspnea, fatigue, anxiety, and depression decreased.
Ortaç et al., 2020	Randomized placebo-controlled study	Patients with symptomatic TOS	Kinesio taping	Not reported	Pain; paresthesia; functional status; overall health status	Evaluated Kinesio taping for pain, paresthesia, functional status, and general health in symptomatic TOS.
Newman et al., 2020	Case report	Patient with rib-mediated NCCP	Rib-focused multimodal manual/functional management	Not reported	Pain rating; rib excursion; physical examination findings	Clinical improvement was reported following rib-focused musculoskeletal management and functional restoration.
Feng et al., 2021	Literature review	Literature on cervical angina	Conservative care including physical therapy	Not reported	Neurological examination; cervical imaging; pain; treatment response	Cervical disc pathology, foraminal encroachment, radiculopathy, and related mechanisms may produce NCCP-like pain; conservative management is discussed.
Collins & Orpin, 2021	Clinical review	Neurogenic TOS population	Pain education; posture; biomechanics; exercise; individualized rehabilitation	Not reported	Pain; function; symptoms; biomechanical impairments	Supports individualized conservative physiotherapy while acknowledging limited high-quality evidence.
Berg et al., 2015	RCT	30 patients with stable CHD and intercostal trigger-point chest pain	Deep friction massage + heat vs heat alone	Not reported	VAS 0–100; health-related quality of life	Combined deep friction massage and heat produced greater pain reduction; quality of life improved in both groups without a significant

						between-group difference.
Burgstaller et al., 2014	Systematic review/meta-analysis	RCT evidence; two musculoskeletal NCCP RCTs involved 229 patients	Non-surgical interventions including manual therapy and exercise/self-management	Not applicable	Pain; treatment efficacy	Manual therapy was more effective than usual care but was not clearly superior to home exercise in the musculoskeletal NCCP trials.
Stochkendahl et al., 2012	1-year follow-up RCT	115 patients with acute musculoskeletal chest pain	Chiropractic treatment vs self-management	4 weeks treatment; 1-year follow-up	11-point pain scale; perceived change in pain; SF-36	Both groups improved in pain, perceived treatment effect, and SF-36; no significant between-group difference was found at 1 year.
Stochkendahl et al., 2008	Trial protocol	Patients with suspected musculoskeletal chest pain after exclusion of acute serious causes	Manipulation/mobilization/soft-tissue techniques vs posture and stretching self-management	Not reported	Pain; physical function; general health; perceived treatment effect; cost-effectiveness	Provided a structured framework for identifying and treating musculoskeletal chest pain and comparing manual treatment with self-management.
Jensen, 2001	Clinical review	Musculoskeletal NCCP/chest-wall disorders	Manual therapy and physical management	Not reported	Clinical examination; pain reproduction with movement/palpation	Musculoskeletal causes may account for a substantial proportion of NCCP; pain may be reproduced by movement or palpation, supporting careful physical examination.
Wells, 1997	Clinical review	Patients with cervical spine-related chest pain	Traction; physical therapy; exercise	Not reported	Pain; neurological/functional symptoms	Conservative treatment including traction and exercise was described for cervical causes of angina-like chest pain.
Kenny et al., 1993	Prospective study	8 patients with TOS	Graduated resisted shoulder-elevation exercise	3 weeks	Symptoms; cervical and shoulder ROM	Symptoms improved and cervical/shoulder ROM normalized; the small uncontrolled sample limits inference.

Summary of Included Studies The table below expands the evidence base across auditory, visual, and somatosensory cueing modalities. Studies were selected to reflect a range of designs (RCTs, crossover trials, pilot studies, and reviews) and to demonstrate consistency of findings across different gait outcomes.

IV. DISCUSSION

The evidence suggests that physiotherapy can play a relevant role in the assessment and management of NCCP, especially in those cases in which musculoskeletal, respiratory and/or functional components are related to persistent symptoms. Despite, the evidence is inconsistent and of varying strength, depending on the clinical presentation, the physiotherapy intervention and even the component, they need to be addressed. Manual therapy, therapeutic exercise, breathing exercises, inspiratory muscle training, postural correction, and patient education have been reported in a wide variety of NCCP-related conditions, where a reduction in pain and in the functional, respiratory and quality of life values have been achieved. Therefore, physiotherapy should be considered within the management of NCCP as part of a multidisciplinary approach and to be driven by the identified components related to each patient clinical presentation and functional capacity.

➤ *NCCP'S Musculoskeletal Contributors*

According to the evaluated literature, musculoskeletal NCCP has the greatest direct physiotherapy proof. Movement, palpation, or loading can mimic mechanical chest pain, supporting evaluation of the ribs, muscles, joints, and cervical and thoracic spine. [5]. In patients with repeatable intercostal trigger-point pain, Berg et al. (2015) reported deep-friction massage combined heat reduced pain more than heat alone, however quality-of-life improvements were not statistically significant. [9] In patients with pectoralis trigger points, Şengül and Şengül (2024) observed significant pain reduction when trigger-point injection was paired with stretching; however, the intervention was not just physiotherapy. [13] Newman et al. (2020) reported of self-management and rib-focused multimodal management. [15]

Other context is provided by Burgstaller et al. larger systematic review and meta-analysis, which found that while manual treatment was beneficial when compared to standard care, it was not consistently superior to at-home exercise. [2] This reinforces the significance of self-management, exercise, education, and functional restoration in addition to symptom-modifying therapy.

➤ *Vascular Contributors: Thoracic Outlet Syndrome*

The research suggests that thoracic outlet syndrome is a vascular/neurovascular contributor. Pain, paraesthesia, weakness, heaviness, and symptoms related to the upper or chest regions might all be present. [16] TOS offers a clinically useful theoretical framework for chest symptoms resulting from upper-quarter neurovascular dysfunction, but it is not the same as all kinds of NCCP. According to Joshi et al. (2026) systematic review, common conservative techniques

include posture correction, stretching, scapular stabilization, neural mobilization, and rehabilitation. Although there were significant differences in treatment procedures, improvements in pain and upper-limb function were documented. [17] Eight patients with TOS were investigated by Kenny et al. (1993) using progressive resisted shoulder-elevation exercises; symptoms and cervical and shoulder range of motion improved; however, causal inference is limited due to the small sample size and lack of a control group. [12] In a randomized, placebo-controlled trial, Ortaç et al. (2020) evaluated Kinesio taping by measuring pain, paresthesia, function, and overall health.[18]

In 88 patients with contested TOS, Goharinejad et al. (2024) assessed mobile application-based rehabilitation. While some neck pain and disability results favored the treatments, both groups showed improvement. [14] Individualized physiotherapy may be enhanced by technology-assisted self-management, but it shouldn't take the place of clinical evaluation.

Elshinnawy et al. (2026) randomized trial investigated respiratory parameters and discomfort in persons with TOS after an osteopathic/physical therapy-based intervention. [19] Exercise, postural and scapular methods, neural mobilization, education, and specific adjunctive therapies are all used in the TOS literature to promote customized conservative care. Direct comparison between trials is still severely hampered by variations in TOS classification, therapeutic dosage, outcome selection, and follow-up.

➤ *Neurological Contributors: Cervical Angina*

According to the evidence now available, cervical angina is a significant neurological and musculoskeletal contributor in NCCP. It describes angina-like chest pain that results from cervical spine disease and may be accompanied by upper-limb discomfort, neck pain, restricted cervical movement, or radicular symptoms.[20]. Neural irritation, cervical nerve-root compression, foraminal constriction, and cervical disk pathology have all been suggested as potential causes of the chest discomfort manifestation. According to Feng et al.(2021), conservative treatment, such as cervical traction, neck support, and medication, may alleviate symptoms; in situations that are not improving, surgical decompression may be an option [20]

Cervical traction, physical therapy, nonsteroidal anti-inflammatory medications, and muscle relaxants are examples of conservative treatments, according to Wells P (1997). When symptoms do not improve with conservative treatment, surgical referral is taken into consideration.[21]. The research on cervical angina generally encourages the use of conservative, customized treatment, such as exercise, traction, physiotherapy, and cervical mobility techniques when clinically necessary. Nevertheless, the evidence is still scant and primarily derived from literature studies and clinical accounts rather than controlled physiotherapy trials. Direct comparisons between studies are further limited by variations in underlying cervical disease, clinical presentation, therapeutic strategies, and outcome evaluation.[20], [21]

➤ *Respiratory Contributors To NCCP*

Respiratory contributors to NCCP are considered when chest pain and dyspnea coexist without cardiac disease. The reviewed evidence is very limited, consisting primarily of a single case report rather than controlled trials. [15]

In a case report, Huzmeli and Yildiz Özer evaluated a six-week program of aerobic exercise and inspiratory muscle training at 30% of maximal inspiratory pressure in a 38-year-old man presenting with NCCP and dyspnea. Improvements were reported across functional capacity, physical activity, pulmonary function, respiratory and peripheral muscle strength, dyspnea, fatigue, anxiety, and depression. [7]

Respiratory parameters have also been considered in the management of NCCP and related conditions. Elshinnawy et al. (2026) evaluated respiratory parameters alongside pain outcomes in adults with TOS following an osteopathic/physical therapy-based intervention.[19] The inclusion of respiratory outcomes highlights the potential relevance of altered breathing mechanics and thoracic function in patients with chest and upper-quarter symptoms. Suryavanshi et al. (2025) incorporated diaphragmatic breathing as part of a multimodal physiotherapy intervention for NCCP. Diaphragmatic breathing may support more efficient respiratory mechanics and reduce excessive accessory muscle activity.[8] Breathing exercises may therefore complement interventions targeting pain, mobility, and functional limitations. However, the independent contribution of respiratory-focused interventions remains unclear because these approaches were used within broader multimodal programmes.[7] Differences in intervention protocols and outcome measures further limit direct comparison between studies. Further controlled research is required to clarify the specific role of respiratory physiotherapy in NCCP, particularly in patients with associated breathing dysfunction.

Overall, dedicated evidence for a distinct respiratory contributor to NCCP is sparse and currently limited to a single case report, though breathing-based interventions and respiratory outcome measures recur as a secondary theme across the neurovascular and psychological categories — suggesting respiratory dysfunction may be better understood as a cross-cutting feature of NCCP rather than a fully independent diagnostic category, pending larger controlled trials.

➤ *Gastrointestinal and Psychological Contributors*

Gastrointestinal and psychological mechanisms are clinically relevant because NCCP may coexist with reflux-related symptoms, altered breathing patterns, anxiety, and heightened symptom perception. In the 2025 randomized controlled trial by Suryavanshi et al., diaphragmatic breathing, Jacobson relaxation, and dynamic neuromuscular stabilization were added to pharmacological treatment and education. After four weeks, both groups improved, with greater reductions in GERD-related symptoms and pain in the intervention group. [8]

The study is relevant to physiotherapy because it illustrates a biopsychosocial approach in which breathing, relaxation, movement control, and medical management are considered together. At the same time, the intervention was multimodal, so the independent contribution of diaphragmatic breathing, relaxation, or dynamic neuromuscular stabilization cannot be separated. Longer follow-up and component-specific trials are needed to determine which elements provide the greatest clinical benefit.

V. CLINICAL IMPLICATIONS

The reviewed evidence supports a staged clinical approach. First, chest pain should be treated as a potentially serious symptom, and appropriate medical evaluation should precede physiotherapy when indicated. Second, once serious causes have been appropriately excluded, the physiotherapist can assess musculoskeletal, cervical/neurological, neurovascular, respiratory, gastrointestinal-related, and functional contributors. Third, the dominant or interacting mechanism should be identified. Finally, rehabilitation should be individualized to the identified impairments and patient goals.

- For reproducible musculoskeletal chest pain: consider targeted manual therapy, heat, stretching, exercise, and functional restoration within an active self-management plan.
- For TOS-related presentations: consider postural correction, scapular stabilization, appropriate stretching, neural mobilization, exercise, education, and selected adjunctive strategies such as taping or technology-assisted self-management.
- For suspected cervical angina: consider cervical and neurological assessment and conservative cervical management when appropriate, while maintaining appropriate medical referral pathways.
- For NCCP accompanied by dyspnea or reduced functional capacity: consider individualized aerobic and inspiratory muscle training when clinically appropriate.
- For selected gastrointestinal/psychological presentations: breathing retraining, relaxation, and trunk-control strategies may be considered as adjuncts to medical management and education.

VI. LIMITATIONS AND QUALITY OF THE REVIEWED RESEARCH

- The evidence base is heterogeneous and includes randomized trials, prospective studies, case reports, reviews, a meta-analysis, and a trial protocol.
- Several studies have very small samples, including the eight-participant TOS study and the single-patient respiratory NCCP case report.
- Many interventions are multimodal, making the independent effect of individual physiotherapy components difficult to determine.
- Outcome measures differ substantially across studies, limiting direct comparison.
- Long-term follow-up is uncommon.

- Cervical angina and TOS are clinically relevant NCCP-like presentations but are not synonymous with every form of NCCP.
- The present synthesis uses the supplied 18-article evidence set rather than a newly performed systematic review; therefore, completeness of the literature and publication bias cannot be quantified.

VII. NEED FOR FUTURE RESEARCH

- Develop clinically useful phenotypes distinguishing musculoskeletal, vascular, neurological, respiratory, gastrointestinal, and psychological contributors to NCCP.
- Conduct adequately powered randomized controlled trials using standardized and reproducible physiotherapy protocols.
- Compare targeted physiotherapy with credible active comparators such as structured home exercise, education, or usual conservative care.
- Use standardized outcomes including pain, disability, return to activity, quality of life, functional capacity, adherence, adverse events, and healthcare utilization.
- Include longer follow-up to determine whether treatment effects are maintained.
- Investigate multidisciplinary pathways integrating physiotherapy with appropriate medical, psychological, cardiological, vascular, neurological, and gastrointestinal care.
- Report treatment dosage, progression, adherence, therapist training, and adverse events sufficiently to allow replication.

VIII. CONCLUSION

The available evidence supports an individualized and mechanism-oriented approach to physiotherapy management of non-cardiac chest pain (NCCP) following appropriate exclusion of serious disease. Musculoskeletal presentations demonstrate the most direct physiotherapy evidence, particularly for manual therapy, therapeutic exercise, and self-management, while thoracic outlet syndrome shows growing evidence for conservative rehabilitation strategies. Cervical angina remains clinically important but is supported mainly by clinical reports and literature reviews, with limited direct evidence for specific physiotherapy interventions. Respiratory and gastrointestinal/psychological approaches, including breathing exercises, inspiratory muscle training, relaxation, and multimodal rehabilitation, show promising but preliminary findings. Overall, physiotherapy may serve as an important component of multidisciplinary NCCP management, with treatment guided by the underlying clinical contributor, patient presentation, and functional needs. Future research should focus on clearly defined NCCP subgroups, standardized intervention protocols, clinically meaningful outcomes, adequate sample sizes, and longer follow-up to establish the effectiveness of physiotherapy across different NCCP presentations.

REFERENCES

- [1]. Japa JP, Zitser P, Ehioghae M, Yoon K, Lee L, Thiru S, et al. Cervical Angina: An Often-Overlooked Cause of Noncardiac Chest Pain. *JBJS Rev.* 2026;14(2). doi:10.2106/JBJS.RVW.25.00238.
- [2]. Burgstaller JM, Jenni BF, Steurer J, Held U, Wertli MM. Treatment efficacy for non-cardiovascular chest pain: a systematic review and meta-analysis. *PLoS One.* 2014;9(8):e104722.
- [3]. Fass R, Achem SR. Noncardiac chest pain: epidemiology, natural course and pathogenesis. *J Neurogastroenterol Motil.* 2011;17(2):110-123. doi:10.5056/jnm.2011.17.2.110.
- [4]. Katz PO, Dunbar KB, Schnoll-Sussman FH, Greer KB, Yadlapati R, Spechler SJ. ACG clinical guideline for the diagnosis and management of gastroesophageal reflux disease. *Am J Gastroenterol.* 2022;117(1):27-56. doi:10.14309/ajg.0000000000001538.
- [5]. Jensen S. Musculoskeletal causes of chest pain. *Aust Fam Physician.* 2001;30(9):834-839.
- [6]. Stochkendahl MJ, Christensen HW, Vach W, Høilund-Carlsen PF, Haghfelt T, Hartvigsen J. Diagnosis and treatment of musculoskeletal chest pain: design of a multi-purpose trial. *BMC Musculoskelet Disord.* 2008;9:40.
- [7]. Huzmeli I, Yildiz Ozer A. Effectiveness of a training program for a patient with non-cardiac chest pain that combines intervention to improve quality of life, psychological state, and functional capacity: a case report. *Biopsychosoc Med.* 2023;17:27.
- [8]. Suryavanshi AR, Venkatesan P, Shetty R, Pawar M. Effect of Diaphragmatic Breathing Exercise, Jacobson's Relaxation Technique and Dynamic Neuromuscular Stabilization on Gastrointestinal and Psychological Causes of Noncardiac Chest Pain: A Randomized Controlled Trial. *Pain Res Manag.* 2025;2025:8124858.
- [9]. Berg AT, Stafne S, Hiller A, Slørdahl S, Aamot IL. Physical therapy intervention in patients with non-cardiac chest pain following a recent cardiac event: a randomized controlled trial. *SAGE Open Med.* 2015;3:2050312115580799.
- [10]. Stochkendahl MJ, Christensen HW, Vach W, Høilund-Carlsen PF, Haghfelt T, Hartvigsen J. A randomized clinical trial of chiropractic treatment and self-management in patients with acute musculoskeletal chest pain: 1-year follow-up. *J Manipulative Physiol Ther.* 2012;35(4):254-262.
- [11]. Collins E, Orpin M. Physical Therapy Management of Neurogenic Thoracic Outlet Syndrome. *Thorac Surg Clin.* 2021;31(1):61-69.
- [12]. Kenny RA, Traynor GB, Withington D, Keegan DJ. Thoracic outlet syndrome: a useful exercise treatment option. *Am J Surg.* 1993;165(2):282-284.
- [13]. Şengül M, Şengül ST. Efficacy of trigger point injection therapy in noncardiac chest pain: a randomized controlled trial. *Turk J Phys Med Rehabil.* 2024;70(1):98-104.

- [14]. Goharinejad S, Ahrari MN, Moulaei K, Sarafinejad A. Evaluating the effects of mobile application-based rehabilitation on improving disability and pain in patients with disputed thoracic outlet syndrome: a randomized controlled trial. *Int J Med Inform.* 2024;185:105400.
- [15]. Newman DP, Jansen BJ, Scozzafava A, Smith R, Mclean BC. Rib Mediated Non-Cardiac Chest Pain: A Case Report. *Cureus.* 2020 Oct 6;12(10):e10831. doi: 10.7759/cureus.10831. PMID: 33173637; PMCID: PMC7645301.
- [16]. Jones MR, Prabhakar A, Viswanath O, et al. Thoracic Outlet Syndrome: A Comprehensive Review of Pathophysiology, Diagnosis, and Treatment. *Pain Ther.* 2019;8:5-18. doi:10.1007/s40122-019-0124-2.
- [17]. Joshi AV, Shinde S, Chaudhary NS, Chaudhary S. Evidence-Based Diagnostic and Therapeutic Methods for Thoracic Outlet Syndrome: A Systematic Review. *Cureus.* 2026;18(5):e108241.
- [18]. Ortaç EA, Sarpel T, Benlidayı İÇ. Effects of Kinesio Taping on pain, paresthesia, functional status, and overall health status in patients with symptomatic thoracic outlet syndrome. *Acta Orthop Traumatol Turc.* 2020;54(4):394-401.
- [19]. Elshinnawy AM, Eraky ZS, Abdallah EA, Elmasry HM, El-Samouly HM. Effect of osteopathic technique on respiratory parameters and pain in thoracic outlet syndrome. *J Bodyw Mov Ther.* 2026;46:262-266.
- [20]. Feng F, Chen X, Shen H. Cervical Angina: A Literature Review on Its Diagnosis, Mechanism, and Management. *Asian Spine J.* 2021;15(4):550-556.
- [21]. Wells P. Cervical angina. *Am Fam Physician.* 1997;55(6):2262-2264.