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Original Article

Physiotherapy Section

Effectiveness of Manual Therapy on Pain, Range of Motion and Functional Performance among Patients with Myofascial Trigger Point Pain of Upper Trapezius Muscle: A Systematic Review

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ABSTRACT

Introduction: A prominent cause of pain that manifests in the Musculoskeletal System is Myofascial Trigger Points (MTrPs). MTrPs Points provide a clear basis for evaluation, often resulting in neck pain that can lead to occupational disability. In recent years, effective manual therapeutic strategies have been implemented to manage MTrPs. These strategies include myofascial release, positional release, muscle energy techniques, Ischaemic Compression (IC) therapy, transverse friction massage, manual pressure release, trigger point therapy, and exercise therapy.

Aim: The present review aimed to determine the effect of various Manual Therapy (MT) techniques on pain, Range Of Motion (ROM), and functional performance among patients with Myofascial trigger point pain of the upper trapezius muscle and extract promising techniques from evidence-based practice in managing them.

Materials and Methods: The present review has been registered under International Prospective Register of Systematic Reviews (PROSPERO) with a unique no. CRD42023427359. Databases of PubMed, Google Scholar, and Cochrane were searched. The search was conducted between March 2023 and October 2023. Methodological quality was assessed independently by two authors using the Physiotherapy Evidence Database (PEDro) scale. Four main outcome parameters were evaluated in the short and medium term: pain, pressure threshold, cervical ROM, and disability, including muscle stiffness.

Results: After fulfilling the inclusion and exclusion criteria, 15 articles were incorporated in the systematic review. Two independent authors verified and screened data and the third author double-checked and searched for additional articles. The findings reveal that MT influences the clinical presentation in patients with upper trapezius trigger points by reducing pain intensity and duration, while also accelerating cervical ROM and decreasing the incidence of neck disability, indicating a significant role of MT in enhancing the health-related quality of life for those with upper trapezius MTrPs.

Conclusion: The current study comes to the conclusion that giving patients with upper trapezius trigger points an efficient protocol based on MT therapy and exercise reduces the incidence of adhesion formation, improving neck pain and thereby, greatly enhancing the overall quality of life.

Keywords: Disability, Massage, Movement, Posture, Spasm

INTRODUCTION

Myofascial Pain Syndrome (MPS), is a chronic painful state associated with dysfunction of the myofascial tissues. It has a detrimental effect on function, performance, and productivity for people from every sphere of development, as well as specific populations, such as athletes. This discomfort frequently leads to medical treatment, time away from work, and even severe disability. MPS has a high prevalence of nearly 85% in the general population [1]. The trigger zones, referred to as MTrPs, are the root cause of MPS, causing abnormal muscle contractions and ischemia, leading to pain that often worsens with movement. According to epidemiological studies, 45% to 54% of the world's population experience mechanical pain at some point in their lives. Information technology employees experience neck pain 23% to 33% of the time and limited neck movement 7% to 17% of the time [2]. Healthcare professionals demonstrate a high prevalence ranging from 60% to 76% [3]. Substantial prevalence estimates (48% and 69%) have been observed in teachers, largely attributed to static posture [4]. Similarly, repetitive task among industrial workers reveals pain incidence between 35% and 55% [5]. MTrPs, which are hyperirritable areas located in the taut bands of skeletal muscles that become painful when stimulated by compression or other mechanical stimuli, are the primary features of MPS.

MTrPs can cause a typical pattern of referred pain, at rest or upon stimulation, producing motor dysfunction, and autonomic responses [6]. It may be associated with peripheral and central sensitisation [7-9]. There are two distinct forms of MTrPs: latent and active. Active MTrPs frequently result in muscular weakening and restricted ROM, along with pain at rest and upon palpation (also known as "spontaneous pain"), whereas latent MTrPs are painless at rest but feel tender when touched and may lead to muscle stiffness. Latent points may become active when stressed or overused, causing local and referral pain with palpation [10-16]. Additional notable consequences include increased anxiety, muscle shortening, disrupted muscle contractions, weakness, increased muscle fatigue, and restricted ROM [17-19]. MTrPs can develop in almost every muscle group. However, the muscles involved in maintaining human posture are the most frequently affected, including the levator scapulae, upper trapezius, sternocleidomastoid, scalene, and quadratus lumborum [20]. The

muscle most commonly impacted by MTrP has been identified as the trapezius [21]. The integrated hypothesis builds on earlier theories by including presynaptic, synaptic, and postsynaptic mechanisms of abnormal depolarisation. These mechanisms involve, respectively, excessive release of acetylcholine, defects in acetylcholinesterase, and increased activity of nicotinic acetylcholine receptors [22,23]. The consequent muscular spasm will prevent muscle fibers from unwinding, which may lower arterial inflow and, as a result, the availability of nutrients, calcium, and oxygen. A prolonged spasm may cause damage to the afflicted tissues, which may cause the synthesis and release of endogenous inflammatory and algogenic substances that enhance nociceptive perception [24]. Spot tenderness, taut band, nodule, referral pain, local twitch response, and jump sign are commonly used diagnostic set-ups in the diagnosis of MTrPs inducted by physicians and researchers [25]. Among healthy individuals, the most prevalent indication in mechanical neck discomfort is the presence of activated trigger points in the posterior neck muscles [26]. Isolating the region of pain and the intensity of trigger points has been accomplished using a pressure algometer with Pain Pressure Threshold (PPT), ROM, electromyography, and Visual Analogue Scale (VAS) [27]. MT is a form of therapy that uses hands to make corrections and maintain structures to prevent re-overuse of the same areas [28].

A considerable number of research papers on upper trapezius trigger points have been published, examining the effects of MT alone, combined with other MT, and along with conventional therapy. MT is extremely important to improve health-related quality of life and to reduce the possibility of myofascial pain-related symptoms. As per the authors' knowledge, few studies have summarised the effect of MT on upper trapezius trigger points. The present systematic review seeks to analyse available data and provide an understanding of the manual approaches for trigger points patients to provide applicable therapeutic recommendations, direct future research, and identify and deliver the best care for this debilitating condition.

MATERIALS AND METHODS

The present review was prospectively registered on the International Prospective Register of Systematic Reviews (PROSPERO) with registration number CRD42023453737. The findings in the current systematic review are being revealed in line with the most recent Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [29]. Medical Subject Headings (MeSH) and Descriptors of Science and Health (Decs) were used to establish the search strategy. The same descriptors were found and articles were found by matching descriptors using the Boolean operators AND and OR. Papers were identified using keywords or expressions: "Upper trapezius trigger points" OR "Physiotherapy" OR "Manual Therapy". The search was conducted between March 2023 and October 2023 in the following databases: PubMed, Google Scholar, and Cochrane. [Table/Fig-1] depicts the Article search strategy using the Boolean Operators.

Database	Keywords used with Boolean Operators	Studies Found
PubMed	"Upper trapezius trigger points" AND "Physiotherapy" OR "Manual Therapy"	66565
Google Scholar	"Upper trapezius trigger points" AND "Physiotherapy" OR "Manual Therapy"	27300
Cochrane	"Upper trapezius trigger points" AND "Physiotherapy" OR "Manual Therapy"	61
Total		93926
Total after removing records during screening		6570

[Table/Fig-1]: Article search strategy using Boolean operators.

Inclusion and Exclusion criteria: Following the PICO model, we considered eligible studies satisfying the following inclusion criteria:

(P) Participants: Individuals suffering from MTrPs of the upper trapezius muscle and levator scapulae, as the proximity of the muscles may lead to overlapping sites for referred pain.

(I) Intervention: Studies with MT as a therapeutic intervention.

(C) Comparator: Any comparator, including another technique or placebo or no treatment, or conventional treatment.

(O) Outcome: The primary outcome designated was a VAS, universal goniometer, and neck disability index, whereas secondary outcome measures included PPT.

Research articles that did not satisfy the selection criteria were excluded from the review.

Study Procedure

Selection of articles: Titles and abstracts from the searches were screened and evaluated independently by two reviewers based on the eligibility requirements. Authors extracted the full text of all titles and abstracts that fulfilled the inclusion requirements, and three impartial reviewers confidentially reviewed these papers to determine their eligibility.

Data extraction: Data was assessed and extracted by authors independently from the full-text documents. Articles to be included in the review were double-checked by the authors and in case of disagreement, a third author was consulted. The authors only included data from neck pain patients with MTrPs in the upper trapezius muscle who have undergone manual therapies with other conventional therapies [1,2,10,16,20,21,23-28,30-32]. The demographic characteristics and summary of the included studies are depicted in [Table/Fig-2].

Risk of bias within studies: A risk of bias graph and summary were developed using Review Manager Version 5.4. In the reviewed studies, allocation concealment and reporting of key outcomes were found to have a low risk of bias. However, blinding of participants was not mentioned in most studies, which raises uncertainty about potential bias. Additionally, elements related to performance bias and incomplete study protocols were considered to have a high or unclear risk of bias, as the authors either did not describe or did not conduct these parts of the trial properly. Random sequence generation had the lowest risk of bias. Out of the included studies, nine presented an overall low risk of bias, whereas at least one high-risk domain was observed in seven included studies. The risk of bias summary for included studies is shown in [Table/Fig-3,4] [1,2,10,16,20,21,23-28,30-32].

Synthesis of Results: The validity of the selected articles was initially assessed using the PEDro for studies evaluating the effectiveness of physiotherapy interventions. In the present review, the authors utilised the PEDro scale to examine the effectiveness of MT interventions in the screened articles. A checklist was applied to assess the reliability and methodological quality of the randomised controlled or clinical trials included in the review. It consists of 11 items, out of which 10 contribute to the final score. These items evaluate key aspects such as random allocation, concealed allocation, blinding of participants, therapists and assessors, adequacy of follow-up and intention-to-treat analysis. The scale also considers whether statistical comparisons between groups and measures of variability are reported. A higher PEDro score reflects greater internal validity and reliability of trial outcomes, making it a valuable aid in evidence-based clinical decision-making [33]. [Table/Fig-5] illustrates the Methodological quality assessment of included studies via PEDro Scale.

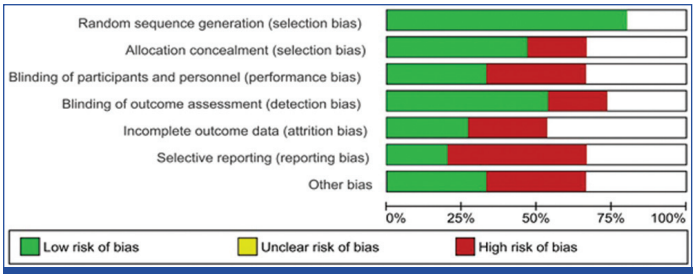
Studies were selected by comparing intervention characteristics with predefined criteria. Data were prepared by converting units and addressing missing statistics. Results were tabulated in structured tables. Narrative synthesis was used due to heterogeneity; meta-analysis was not feasible.

Author	Country	Research outline	Total Participants	Age (Mean±SD)*	Title	Intervention	Selection criteria	Outcome measures	Results
Martin PD et al., 2019 [1]	Spain	Double-blinded randomised clinical trial	60	20.0±2.67	Immediate effects of variables durations of PrRT on latent MTrPs	Group A: PrRT for 30 seconds Group B: PrRT for 60 seconds Group C: PrRT for 90 seconds	At least one latent MTrP in the levator scapulae A Body Mass Index (BMI) between 18.5 and 24.9 kg/m2	-PPT -Active CROM	PrRT for 60 &90 seconds were very effective as compared to PrRT for 30 seconds in increasing PPT and strength in latent MTrPs of the levator scapulae
Kashyap R et al., 2018 [2]	India	Randomised controlled trial	45	21.49±3.66	Controlled intervention to compare the efficacy of MPR and MET for treating mechanical neck pain due to upper trapezius trigger points	Group A: MPR and conventional intervention (isometric neck exercises, postural advice, stretching and conditioning exercises for neck and shoulder girdle muscles) Group B: MET and conventional intervention Group C: Conventional only	Mechanical neck pain localised to the cervical or Bilateral scapular regions, the presence of one or two trigger points No clinical treatment for neck pain within the past month.	-VAS -PPT -NDI	Both MPR and MET are equally effective for decreasing pain intensity and functional disability of the neck as well as increasing the PPT and cervical Range Of Motion (ROM) along with postural correction and active exercises in patients with mechanical pain due to upper trapezius trigger points
Pawaria S et al., 2015 [10]	India	Randomised clinical trial	26	Not mentioned	Comparing the effectiveness of MFR and Muscle Stretching on pain, Disability, and Cervical ROM in patients with trapezius MTrPS	Group A: MFR with a hot pack Group B: Muscle stretching with hot pack	Having active trigger points in the upper fibers of the trapezius muscle. Having chronic pain for the past 2-3 months	-VAS -NDI -UG	MFR was better than muscle stretching for reducing MTrPs
Fernandez-de-las-penas C et al., 2006 [16]	Spain	Pilot study	40	Group A: 27.7±5.5 Group B: 29.7± 6.2	The immediate effect of ICT and TFM on tenderness of active and latent MTrPs: a pilot study	Group A: ICT Group B: TFM	Presenting with mechanical neck pain for at least 2 weeks, Diagnosed with MTrPs, either latent or active in the upper fibers of the trapezius muscle	-VAS -PPT	Both treatment techniques are equally effective for reducing tenderness in MTrPs
Bether AH et al., 2021 [20]	USA	Randomised clinical trial	60	27.1±8.8	PRT and TM reduce muscle trigger and tender points	Group A: TM Group B: PRT	Male and female participants with upper trapezius pain, of at least 10 mm on the 100 mm VAS and muscle tightness	-VAS - PPT -Shear wave elastography	PRT was very effective in reducing pain and muscle stiffness in comparison to TM
Kojidi MM et al., 2016 [21]	Iran	Single-blind, randomised clinical trial	42	PG: 27.86±6.64 AG: 28.07±5.94 CG: 28.29±6.58	Comparison Between the Effect of Passive and Active Soft Tissue Therapies on Latent Trigger Points of Upper Trapezius Muscle in Women: Single-Blind, Randomised Clinical Trial	Group A: passive soft tissue therapy Group B: active soft tissue therapy Group C: Sham group	A minimum of 1 palpable nodule in the upper trapezius muscle. Hypersensitive tender spot in a taut band in response to 2.5 kg/cm2 of pressure	-VAS -PA -UG	Passive soft tissue therapy has become more effective than active soft tissue therapy in reducing pain and increasing Active Cervical Contralateral Flexion (ACLF) Range Of Motion (ROM)
Wendt M et al., 2020 [23]	Poland	Randomised clinical trial	60	Not mentioned	Evaluation of the combination of MET and TPT in Asymptomatic Individuals with a Latent Trigger Points	Group A: MET+TPT Group B: MET Group C: TPT	Right-handed; Asymptomatic (no pain symptoms in the cervical and shoulder girdle) Presence of latent trigger points (TrPs) on the upper trapezius muscles Practicing amateur symmetrical sports (running, swimming, gym, roller skating, Nordic walking, skiing, yoga, gymnastics, cycling, climbing, canoeing, rowing).	-Geometric electro goniometer -Algometer	MET +TPT combined treatment was very effective as compared to individual treatment

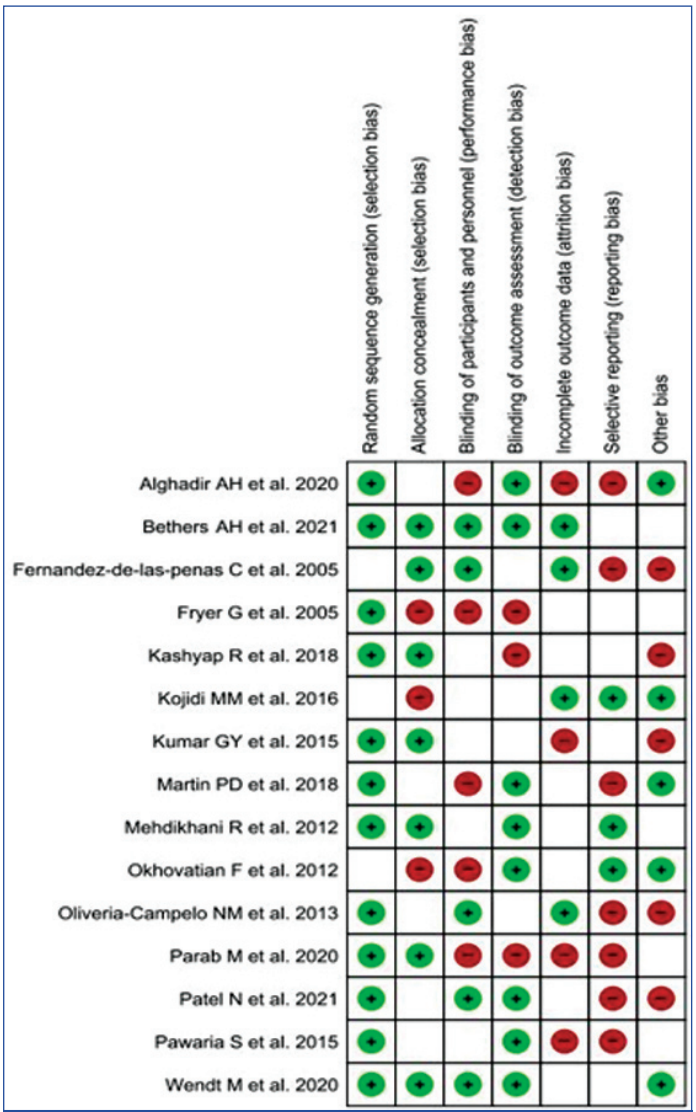
Alghadir AH et al., 2020 [24]	Saudi Arabia	Randomised controlled trial	60	Group A: 32.47 Group B: 32.13 Group C: 32.33	Efficacy of combination therapies on neck and muscle tenderness in male patients with upper trapezius active MTrPs	Group A: ICT plus MET with a hot pack and active stretching. Group B: MET with hot pack and active stretching Control group: hot pack and active stretching only	Male subject diagnosed with nonspecific neck pain, Muscle tenderness over the upper trapezius muscle due to an active MTrP Presence of a maximum of 1-2 active MTrPs in a unilateral upper trapezius muscle	-PA -VAS	MET plus ICT is more efficacious than MET alone in reducing neck pain and muscle tenderness in male patients having active MTrPS in the upper trapezius
Patel N et al., 2021 [25]	India	Randomised clinical trial	30	PRT: 34.66 MET: 37.66	Effectiveness of MET versus PRT on Upper Trapezius Trigger Points in Subjects with Neck Pain -Comparative Study	Group A: PRT+ conventional treatment (hot pack, active neck movements, shoulder bracing exercises, chin tuck exercises, and trapezius stretching), Group B: MET + conventional treatment (same as above)	Neck pain with unilateral upper trapezius trigger point Duration of pain less than 1 month VAS > 5 NDIQ > 15)	-VAS -NDI	Both MET and PRT were significantly effective in reducing pain and neck disability
Fryer G et al., 2005 [26]	Australia	Randomised controlled trial	37	Not mentioned	The effect of MPR on MTrPs in upper trapezius muscle	Group A: MPR Group B: sham procedure	Diagnosed with MTrPs, either latent or active in the upper fibers of the trapezius muscle	-Digital Algometer	MPR therapy was an effective treatment method for treating the MTrPs
Oliveira-Campelo NM et al., 2013 [27]	Portugal	Randomised controlled trial	117	WS:20.44±2.08 PL:20.23±1.57 IC:20.08±1.21 PS:20.6 ±1.93 MET:20.35±2.14	Short- and Medium-Term Effect of Manual Therapy on Cervical Range of Motion (ROM) and pressure pain sensitivity in latent myofascial pain of the upper trapezius muscle: A randomised controlled trial	Group A: MET Group B: Passive stretching Group C: ICT Group D: Placebo technique control group Group E: Wait and see the control group	Latent MTrP in the upper trapezius muscle Average time of computer work of at least 2 hours per day	-CROM instrument -VAS -PPT	Experimental groups showed better improvement in increasing the Range Of Motion (ROM) and pain threshold
Okhovatian F et al., 2012 [28]	Iran	Randomised controlled trial	66	61 years	Comparison between the immediate effect of MPR and SCs techniques on latent trigger points of the upper trapezius muscle	Group A: MPR Group B: SCs technique Group C: Sham ultrasound	Suffering from neck and shoulder pain corresponding to the area covered by the upper trapezius muscle Latent MTrPs in the trapezius muscle.	-PPT -VAS	MPR is more effective than SCs for reducing pain in patients with neck pain due to trigger points
Kumar GY et al., 2015 [30]	India	Experimental study	45	Not mentioned	Effectiveness of MET, ICT, and SCs on Upper Trapezius Trigger Points: A Comparative Study	Group A: MET with tens Group B: SCs with tens Group C: ICT with tens	Not mentioned	-VAS -CROM -NDI	MET was very effective in comparison to other techniques for reducing pain
Mehdikhani R et al., 2012 [31]	Iran	Randomised controlled trial	36	MET: 23.61±2.06 CG: 24.06±1.92	The immediate effect of MET on latent trigger points of the upper trapezius muscle	Group A: MET Group B: Sham ultrasound	Suffering from neck and shoulder pain corresponding with the area covered by the upper trapezius Muscle	-PPT -VAS -Dual Inclinometer	MET was very effective for treating the MTrPs
Parab M et al., 2020 [32]	India	Experimental study	54	MFR: 25.92±6.34 Cryo-stretch: 24.14±4.33	Immediate effects of myofascial release and cryo-stretching in management of upper trapezius trigger points-A comparative study	Group A: MFR Group B: cryo-stretching	Point tenderness on a taut muscle band, Local twitch response, and reproduction of usual pain and restricted cervical Range Of Motion (ROM)	-VAS -PPT -UG	Both MFR and cryo-stretching are equally effective in reducing neck pain due to trigger points

[Table/Fig-2]: Presentation of articles according to the titles and main findings regarding techniques used in the management of upper trapezius trigger points [1,2,10,16,20,21,23-28,30-32].

CROM: Cervical range of motion; ICT: Ischemic compression technique; MET: Muscle energy technique; MFR: Myofascial release; MPR: Manual pressure release; NDI: Neck disability index; PA: Pressure algometer; PPT: Pain pressure threshold; PRT: Positional release technique; PrRT: Pressure release technique; SCs: Strain counter strain; TFM: Transvers friction massage; TPT: Trigger points therapy; TM: Therapeutic massage; UG: Universal goniometer; VAS: Visual analog scale



[Table/Fig-3]: Risk of bias graph for included studies generated using Review Manager Version 5.4.



[Table/Fig-4]: Risk of bias summary for included studies generated using review manager Version 5.4 [1,2,10,16,20,21,23,24-28,30,31,32].
*Alghadir AH et al., (2020) [24]; Bethers AH et al., (2021) [20]; Fernandez-de-las-Penas C et al., (2007) [16]; Fryer G et al., (2005) [26]; Kashyap R et al., (2018) [2]; Kojidi MM et al., (2016) [21]; Kumar GY et al., (2015) [30]; Martin PD et al., (2019) [1]; Mehdikhani R et al., (2012) [31]; Okhovatian F et al., (2012) [28]; Oliveira-Campelo NM et al., (2013) [27]; Parab M et al., (2020) [32]; Patel N et al., (2021) [25]; Pawaria S et al., (2015) [10]; Wendt M et al., (2020) [23].

RESULTS

Selection of Articles

The search strategy identified 93,926 records from three databases and six records from other sources (reference list of the included studies). Following the removal of duplicate articles 6,570 articles were screened for titles and abstracts. Further excluding 3993 records and assessing 3,737 unretrieved records, 2,577 full-text records were assessed for eligibility. Of these, 39 articles were removed following publication in a language other than English, 1,032 articles not concerning upper trapezius trigger points, 25 articles without physiotherapy intervention, 36 articles due to registered protocol type, and 508 articles due to the presence of an abstract only. This resulted in 15 articles for this review. [Table/Fig-6] shows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 flow chart for article selection.

Characteristics of Included Studies and Outcomes

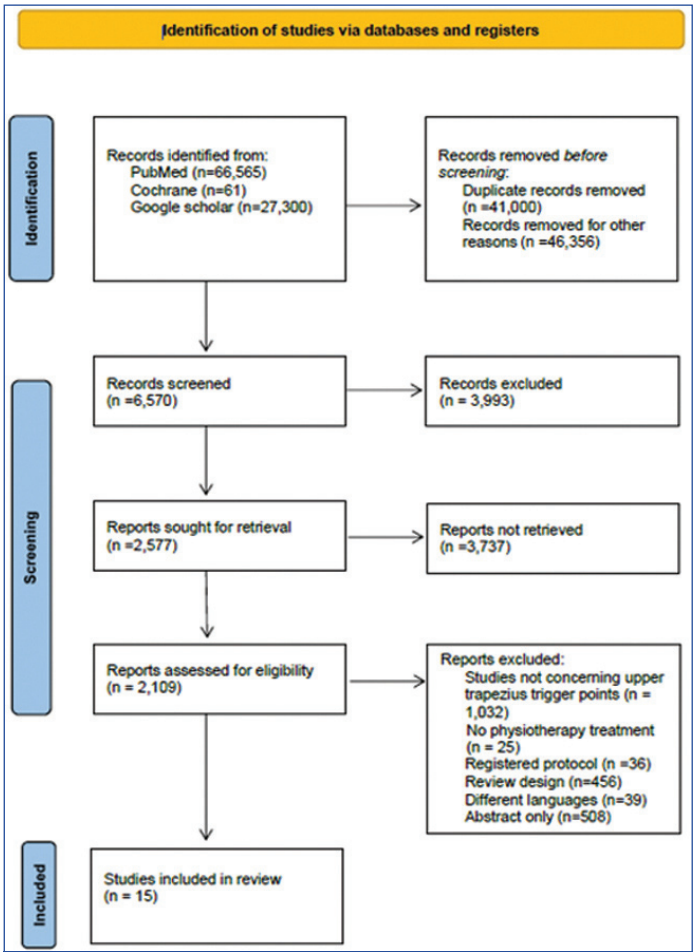
Impact on pain: In a pilot study, conducted to investigated the effect of one treatment session of IC with transverse friction massage in patients with active and latent trigger points, VAS showed significant improvement in both the groups demonstrating benefits of both techniques in patients with MTrPs [16]. A randomised Clinical Trial with patients grouped in Positional Release Therapy (PRT) along with Therapeutic Massage (TM) presented positive results as compared to patients without tender points, demonstrating effects of PRT in reducing pain perception and decreasing muscle spasms [20]. Findings from a study to evaluate the effect of MPR on the upper trapezius in patients with MTrPs demonstrated a significant improvement in pain intensity measured via digital algometer [23].

Range of Motion (ROM): In a study evaluating immediate effect a single session of PRT on the levator scapulae muscle in patients with MTrPs, conducted on 60 healthy students for varied periods of 30 sec, 60 sec, and 90 sec, ROM showed significant improvement for 60 seconds and 90 seconds of application [1]. Another study examining the effect of MFR and muscle stretching in patients with trapezius trigger points depicted considerable improvement in ROM of cervical spine as compared to the conventional group [10]. Findings from another study comparing the effect of passive and active soft tissue therapies in women with latent trigger points, demonstrated improvement in the ROM of the cervical spine when compared to control group [16]. In a study investigating the efficacy of combination therapy of MET and Trigger Points Therapy (TPT) on the trapezius muscle among 60 right-handed asymptomatic student groups receiving MET, TPT, and both MET and TPT respectively, findings were suggestive of an increase in ROM of the cervical spine in all groups on the right side [23,24]. Findings from a study investigating the impact of MET on patients with mechanical neck pain, concluded positive effects of MT in reducing pain sensitivity along with enhancing the cervical ROM [30]. Another randomised controlled trial to determine the effect of MET and IC as treatment of neck pain following trigger points showed significant improvement

	Criterion											
Study	1	2	3	4	5	6	7	8	9	10	11	Score
Martin PD et al., (2019) [1]	1	1	1	1	1	1	-	1	1	1	1	10/10
Kashyap R et al., (2018) [2]	1	1	1	1	-	-	-	1	-	1	1	7/10
Pawaria S et al., (2015) [10]	1	1	1	1	-	-	-	1	-	1	1	7/10
Fernandez-de-las-Penas C et al., (2005) [16]	1	1	1	1	-	-	-	1	1	1	1	8/10
Bether AH et al., (2021) [20]	1	1	-	1	-	-	-	1	-	1	1	6/10
Kojidi MM et al., (2016) [21]	1	1	-	1	1	-	-	1	1	1	1	8/10
Wendt M et al., (2020) [23]	1	-	-	1	-	-	1	1	-	1	1	6/10
Alghadir AH et al., (2020) [24]	1	1	1	1	-	1	1	1	-	1	1	9/10
Patel N et al., (2021) [25]	1	-	-	1	-	-	-	1	-	1	1	5/10

Fryer G et al., (2005) [26]	1	1	1	1	1	-	-	1	-	1	1	8/10
Oliveira-Campelo NM et al., (2013) [27]	1	1	-	1	-	-	-	1	-	1	1	6/10
Okhovatian F et al., (2012) [28]	1	1	1	1	1	-	1	1	-	1	1	9/10
Kumar GY et al., (2015) [30]	1	1	-	1	-	-	-	1	1	1	1	7/10
Mehdikhani R et al., (2012) [31]	1	1	1	1	1	-	-	1	-	1	1	8/10
Parab M et al., (2020) [32]	1	-	-	1	-	-	-	1	1	1	1	6/10

[Table/Fig-5]: Methodological quality assessment of included studies via PEDro Scale [1,2,10,16,20,21,23-28, 30-32].
*The study provides measures of variability. Each positive point in studies is given a score of 1 on 0 to 10: 1) Eligibility criteria were specified; 2) Subjects were randomly allocated to groups; 3) Allocation was concealed; 4) The groups were similar at baseline regarding the most important prognostic indicators; 5) There was blinding of all subjects; 6) There was blinding of all therapists who administered the therapy; 7) There was blinding of all assessors who measured at least one key outcome; 8) Measures of at least one key outcome were obtained from more than 85% of the subjects initially allocated to groups; 9) Intention to treat analysis; 10) Comparison between groups; 11) point measures and measures of variability.



[Table/Fig-6]: Retrieval of articles meeting inclusion criteria as per the PRISMA 2020 flow diagram.

in the ROM for male participants in MET group when compared to the other group [31].

Quality of life: An experimental study, investigating the effect of MET, IC, and Strain Counter strain (SCS) techniques along with conventional therapy in patients with neck pain demonstrated a considerable disability reduction and improvement in quality of life in the participants subjected to MET as compared to the IC or SCs technique [25].

DISCUSSION

The present review aimed to gather evidence about the benefits of manual treatment for pain intensity, cervical ROM, and functional performance in patients with upper trapezius myofascial trigger points. In the general population, myofascial pain is a common disorder that leads to MTrPs, making it crucial to address trigger points and focus on their diagnosis and intervention. MTrPs are considered one of the most evident conditions in patients with neck pain and have been shown to impact functional disability in these individuals. The search included fifteen RCTs, using various MT approaches to treat the upper trapezius MTrPs. The evidence for the effectiveness of MT ranged from very poor to moderate. A meta-analysis was not conducted in this review due to the heterogeneity of the studies.

A form of MT available, which is transverse friction massage, is a useful technique for reducing the pain threshold and tenderness caused by MTrPs [30]. The muscle energy technique also showed a great effect on upper trapezius trigger points and reduced tenderness because this technique showed the neurological effect on the affected area. It inhibits the Golgi tendon reflex and relaxes the antagonist muscle. It is also noted that the IC technique has the potential to reduce the discomfort caused by trigger points and also reduce the tenderness of MTrPs. This technique plays an important role in the rate of lymphatic drainage and increasing the blood flow tendency, also effective in lengthening muscle fibers and muscle flexibility, which helps to dictate the length of the affected soft tissue and also improving contralateral flexion and ipsilateral rotation ROM [34]. The SCs technique also plays a significant role in MTrPs and helps to reduce pain and neck disability and improve the ROM of the cervical spine. Another study demonstrated that office workers suffering from chronic neck pain experienced significant pain alleviation and improved pressure pain threshold after receiving myofascial release therapy, as reported in a randomised controlled trial by Pandya J et al., [35] Also, another clinical trial, in 2023 by Gazbare P et al., demonstrated integrated MT's effectiveness over conventional physiotherapy in addressing VAS scores and cervical ROM. Myofascial release technique has been proven to be effective in improving the ROM and reducing pain and functional disability. It is a highly interactive soft-tissue stretching technique. According to this method, all muscle stretching involves the stretching of myofascial units because a muscle cannot be isolated from the body's other components. MT in the form of cryo-stretching has also been effective in reducing pain pressure sensitivity [36]. Other included studies by Conte da Silva A et al., (2024) in the systematic review showed that MT, particularly in combination with exercise, was far more effective in the deactivation of trigger points and in the holistic improvement of the quality of life compared to the two interventions done separately [37].

Various range of intervention procedures have been marked to positively influence the symptoms of neck pain and regaining health-related quality of life. A varying range of intervention techniques have been proposed in the study with different sets of combinations. Some manual therapies like (myofascial release technique [20,35], manual pressure release [2,34,38], strain counterstain technique [32-38], positional release technique [27,32], muscle energy technique [2,31,32], transverse friction massage technique and IC technique [28] performed over the affected areas have been beneficial in reducing complaint of the patient with neck pain due to trigger points. It has been noted that this intervention individually as well as in combination has better effects. In addition, MT, physiotherapy protocol involving stretching of the muscles as well as exercises targeting the pain and functional range of the affected areas has shown significant results in overcoming disability and significant effects on health-related quality of life.

Manual pressure release is another version of MT that has also shown a positive effect on improving pain and has significantly proven to be

effective in reducing pressure pain sensitivity, functional disability, and pain intensity [2,36,37]. Another MT, such as the positional release technique, is very effective for reducing pain and neck disability. Only a 5-minute treatment of this technique showed significant improvement in pain intensity and decreased muscle stiffness. The TM is also a type of MT that is done by the physiotherapist. It is a combination of effleurage and petrissage used in an organised manner for the treatment of trigger points. This manual technique has been proven to increase muscle thickness and reduce muscle tightness [27,31,32].

Therefore, it is evident that the MT techniques, including myofascial release, positional release technique, transverse friction massage, IC technique, TM, muscle energy technique, and pressure release technique, as well as exercise protocols involving passive muscle stretching exercises, have proven to be effective.

According to the review's findings, MT treatment may benefit individuals with upper trapezius myofascial trigger points and improve their overall health-related quality of life. The authors' thorough search strategy and commitment to following established methodological standards are the strongest aspects of the work. By focusing on recent, high-quality systematic reviews of MT techniques, the authors have ensured that the findings are both relevant and reliable.

Limitation(s)

While systematic reviews offer valuable insights, limitations exist in the present study. Publication bias could skew results if studies with positive outcomes are overrepresented. Additionally, variations in MT techniques and therapist expertise across studies may affect the consistency and generalisability of results. The heterogeneity in patient populations and outcome measures could hinder direct comparisons and synthesis of data. The duration of follow-up in included studies might not capture long-term effects accurately. There is lack of an advanced physiotherapy protocol, which affected the strength of the study.

Future Recommendations

It is recommended to conduct future randomised controlled trials with longer follow-up periods to better validate the findings. Additionally, exploring the potential mechanisms of action behind MT's effectiveness on pain, ROM, and functional performance, along with strategies for providing instant relief to enhance quality of life, would improve understanding. Incorporating diverse populations and considering other variables such as psychological factors and patient preferences could offer a comprehensive view of the role of MT in managing MTrPs. Investigating the comparative effectiveness of different MT techniques and their long-term effects could provide valuable insights for optimising treatment strategies in clinical practice.

CONCLUSION(S)

The present study concludes that effective MT protocol significantly improves the overall quality of life in patients with trigger points in the upper trapezius. Key findings of the present review suggest that manual therapies can potentially act as an important aspect in improving health-related quality of life among individuals affected with MTrPs of the upper trapezius. An unbiased and efficient diagnosis makes it easier to plan a protocol to eliminate the symptoms in such patients. Early diagnosis is essential to reduce the chances of adhesion formation. MT techniques as well as exercise protocol in combination have the best results in efficient improvement of neck pain.

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