



A Systematic Analysis Comparing the Efficacy of Deep Tissue Massage and Dry Needling Therapy for Patients with Upper Trapezius Trigger Points Linked to Neck Pain.

Aanchal Sharma¹, Navjyot Trivedi^{1*}

¹Department of Physiotherapy, University Institute of Allied Health Sciences, Chandigarh University, India 140413

(Received: 16 March 2025

Revised: 20 April 2025

Accepted: 01 May 2025)

KEYWORDS

Dry needling therapy, deep tissue massage, range of motion, myofascial pain syndrome, neck disability index.

ABSTRACT:

Background: Neck pain is a common musculoskeletal issue, often caused by myofascial trigger points in the upper trapezius muscle. These trigger points lead to discomfort, reduced function, and can greatly affect daily activities.

Objective: This review examines how effective deep tissue massage (DTM) and dry needling therapy (DNT) are in relieving pain (measured by VAS and PPT) and improving function (measured by NDI) in patients with upper trapezius trigger points and neck pain related to myofascial pain syndrome (MPS).

Methodology: A thorough search of databases like PubMed, Scopus, Cochrane Library, and PEDro was conducted for studies published between January 2014 and December 2024. Only studies comparing DNT and DTM in adults (18-65) with upper trapezius trigger points and neck pain were included. Two reviewers assessed study quality using the PEDro scale and Cochrane Risk of Bias tool.

Results: According to the findings DTM was better at managing pain over the long term and gradually enhancing function, whereas DNT offered substantial pain reduction over the first 24 to 72 hours.

Conclusion: In summary, both treatment methods provide benefits, but dry needling has been shown to be more effective than deep tissue massage in treating myofascial pain syndrome.

INTRODUCTION

Neck pain has been the leading cause of discomfort in the lifestyle of the people, affecting the daily living activities (ADLs) (Greenberg *et al.*, 2014). The condition commonly affects the neck and shoulder, often resulting from overuse or poor posture. Key muscles involved in MPS include the upper trapezius, levator scapulae, and infraspinatus. Symptoms of active trigger points include local and referred pain, muscle weakness, decreased range of motion, and muscle tightness (Lew *et al.*, 2021). MPS is more prevalent in women than in males, according to numerous research examining the distribution of MPS by gender in the literature. Treatment for myofascial pain syndrome (MPS) focuses on breaking the pain cycle. Common approaches include local anesthetics, botulinum toxin A, steroids, dry needling, positional release technique (PTR) and cold spray. Additionally, pain relief is often supported by

pharmacological treatments and medications. Around 80% of the general population experiences MPS, with 10-20% developing chronic symptoms. Positional release technique (PRT), are commonly used to treat upper trapezius trigger points (MTrPs) Research shows that PRT helps improve pain pressure threshold, increase cervical range of motion, and reduce pain intensity and neck disability in patients with upper trapezius MTrPs (Bingölbali *et al.*, 2024; Pattnaik & Sharma, 2024). The main goal of treating myofascial pain is to deactivate trigger points (MTrPs), typically through dry needling (DN) or manual pressure (MP). In MP, the physiotherapist applies gradual pressure to the trigger point to relieve pain, while in dry needling, a needle is inserted directly into the MTrP in deep needling, or into the skin and surface muscles in superficial needling (De Meulemeester *et al.*, 2017). Physiotherapists have been using dry needling, also known as intramuscular needling, since the 1980s in countries like Canada, Chile,



Ireland, Spain, South Africa, the UK, and the US (since 1984) (Unverzagt *et al.*, 2015). Myofascial pain has been a clinical issue that has sparked curiosity and perplexity. Over time, the diagnostic standards and their relative significance have changed. Myofascial discomfort is common and often leads to trips to pain clinics and primary care doctors (Skootsky *et al.*, 1989; Gerwin RD *et al.*, 2001). Muscle discomfort from trauma, injury, overuse, or strain is a common occurrence for most people. Whether or not medical care is received, this kind of discomfort usually goes away in a few weeks. However, in many instances, muscle discomfort may last long after the injury has healed and may even affect other bodily areas, which are often nearby or contiguous rather than distant. During a physical examination, a Myofascial Set off Point (MTrP) is a distinct, painful, and very irritable nodule in a tight band of skeletal muscle (Irnich D. *et al.*, 2013). Although it may not be the direct cause, an active MTrP is linked to the pain of the syndrome of myofascial pain (MPS). In certain invoked pain patterns, instinctive discomfort in the actual encompassing tissue and/or remote areas is clinically linked to an active MTrP. The rehabilitant's instinctive pain representation is made worse by intense digital pressure on the active MTrP, which intensifies the patient's instinctive pain representation and reproduces the patient's familiar pain acquaintance. MTrPs may also be categorized as latent, meaning that they are physically commenced but not linked to an onset of pain (Irnich D. *et al.*, 2013). On the other hand, local discomfort at the nodule location is caused by pressure on the latent MTrP (Celik D. *et al.*, 2013). Muscular weakness, restricted range of motion, and muscular dysfunction can all be linked to latent or active MTrPs. There has been much discussion over the years on whether myofascial trigger points (MTrPs) must be physically present in order for MPS to be defined.

When correlated to lurking MTrPs or other areas of the body without MTrPs, active MTrPs were shown to have greater absorptions of provocative mediators, neuropeptides, cytokines, and catecholamines in small-sample research (Shah JP *et al.*, 2008). Latent MTrPs have been shown to affect motor recruitment patterns (Monterde S *et al.*, 2014), hasten agonist muscle exhaustion (Ge HY *et al.*, 2012), and seem to be associated with increased antagonist muscle activity (Ibarra JM *et al.*, 2011). There are several different

manual and non-manual methods for deactivating trigger points. Injections of botulinum toxin, stretching techniques, ethyl chloride spray, acupuncture, and dry needling are examples of non-manual therapies. MET, myofascial release, strain-counterstrain (SCS), proprioceptive neuromuscular facilitation, and ischemia compression are a few types of manual therapy (Alvarez and Rockwell, 2002). A nominally presumptuous technique called dry needling involves inserting an acupuncture needle straight into an MTP (Kalichman and Vulfsons, 2010a). The advantages of DN are becoming more widely recognized and include immediate relief from local, generalized, referred, and localized pain (Lewit, 1979; Hsieh *et al.*, 2007; Fernandez-Carnero *et al.*, 2010; Affaitati *et al.*, 2011) as well as the reclamation of range of motion and muscle exhilarating patterns (Lucas *et al.*, 2004; Fernandez-Carnero *et al.*, 2010; Lucas *et al.*, 2010). Applying massage therapy to the sensitive region is one of the treatment modalities that patients choose in addition to their therapies for greater relaxation and that therapists usually suggest (Miernik *et al.* 2012). The gate control hypothesis states that massage treatment (MT) is recognized to alleviate pain. By eliminating pain mediators brought on by vasodilation, it also lessens pain (Field *et al.*, 2007). Deep tissue massage is one such technique (DTM) (Hong 2006).

Factors causing Myofascial Trigger Points:

Overuse of the muscle or trauma: Repeated microtrauma, overloading, or sustained muscle contractions can lead to the formation of TrPs. These stresses result in localized muscle ischemia and hypoxia, triggering the clemency of inflammatory and pain-inducing substances, which perpetuate the condition (Cesar *et al.*, 2023).

Vitamin and mineral insufficiencies: In a study by Simons, it was found that certain nutritional deficiencies can contribute to myofascial pain syndrome (MPS). For example, not getting enough Vitamin B12 can lead to muscle pain and trigger points, along with general weakness. Folic acid deficiency may cause muscle pain, fatigue, and even irritability. A lack of Vitamin C can leave muscles feeling weak and tired, while also causing joint pain. Calcium is vital for muscle function, and without it, you might experience muscle and joint soreness. Similarly, low magnesium levels are often



linked to ongoing muscle pain and fatigue (Lalchhuanawma, 2021).

Dysfunction of the motor endplate: When too much acetylcholine is released at the neuromuscular junction, it can lead to continuous muscle contractions and the formation of tight muscle bands, which are often seen in myofascial trigger points (MTrPs). A key factor in the development of these points is a malfunction at the motor endplate, where nerve signals communicate with muscles. This malfunction happens when the neuromuscular junction produces an excessive amount of acetylcholine (ACh), the chemical responsible for triggering muscle movement. With more ACh than necessary, the muscle fibers stay contracted, creating persistent tension. Over time, this sustained contraction results in the formation of tight, painful muscle bands that define trigger points. (Cesar *et al.*, 2023).

Emotional and Psychological: Research on muscle sympathetic nerve activity (MSNA) in people with chronic anxiety shows that increased sympathetic outflow is common. Those with chronic anxiety tend to have higher MSNA, leading to more muscle tension and tone. This heightened nervous system activity can result in greater muscle stiffness, fatigue, and a lower pain threshold, which may contribute to conditions like myofascial pain syndrome (MPS) (Holwerda *et al.*, 2018).

Psychological Stress: Chronic stress and associated biochemical changes may aggravate muscle tension and TrP formation.

Systemic Conditions: Disorders such as fibromyalgia, metabolic imbalances, and autoimmune conditions have been identical with an increased pervasiveness of TrPs (Bodine *et al.*, 2023).

Postural and Biomechanical Stress: Poor posture and repetitive strain can predispose specific muscle groups to TrPs.

Peripheral Sensitization: Localized pain at TrPs is often driven by sensitized nociceptors in muscle tissue. Peripheral sensitization is a process that frequently causes the discomfort you experience in trigger points (TrPs). This occurs when the muscle's nociceptors—pain receptors—become overly sensitive. These receptors typically respond to damaging stimuli, but in the case of TrPs, they become excessively receptive, causing pain to

be triggered by even slight pressure or movement. Because of this, the pain is often more severe, lasts longer, and is sharper than normal muscle soreness.

Central Sensitization: Chronic activation of TrPs can lead to heightened pain clarification in the nervous system (CNS), contributing to referred pain patterns and intensifying discomfort. Central sensitization is a condition that can result from long-term activation of trigger points (TrPs), which can alter the neurological system. This implies that the discomfort is increased as the nervous system grows more sensitive to pain. In addition to making the pain worse, this can cause it to radiate to other parts of the body, resulting in referred pain patterns that further complicate the overall pain experience.

Loss of Inhibitory Neural Control: Impaired descending pain modulation from the brainstem and spinal cord may exacerbate TrP activity.

Recent theories suggest that fascial abnormalities (e.g., fibrosis) and genetic predispositions may also contribute to TrP development. Studies are exploring the role of mechano-transduction and connective tissue dysfunction in chronic pain syndromes.

Population most likely to be affected with MTrPs:

Adults aged 30 to 60 years are most commonly affected, as this group experiences higher occupational and physical stress, which predisposes them to muscle strain and MTrPs. However, older populations also show prevalence due to degenerative changes and reduced muscular resilience (Cesar *et al.*, 2023). Among the adult population, women are more likely than men to develop MTrPs, potentially due to differences in muscle structure, hormonal influences, and higher rates of conditions such as fibromyalgia, which often coexist with MTrPs (Hesan Rezaee *et al.*, 2024). Individuals in physically demanding or repetitive-motion jobs (e.g., manual laborers, assembly line workers) and sedentary office workers are at increased risk. Impoverished ergonomics and prolonged postures contribute significantly to the advancement of MTrPs (Sattam S. *et al.*, 2023). People with chronic pain syndromes, such as migraines, fibromyalgia, or temporomandibular disorders (TMD), often exhibit a higher prevalence of MTrPs. Anxiety, depression, and other psychological factors also correlate with increased MTrP occurrence, likely due to heightened muscle tension and pain perception (Hesan



Rezaee *et al.*, 2024). Athletes and individuals engaged in regular high-intensity exercise are prone to MTrPs due to repetitive muscle overuse and insufficient recovery (Sattam S. *et al.*, 2023).

Diagnostic Investigations

Physical Examination: Clinicians typically rely on manual palpation to identify MTrPs. Key diagnostic features comprise the presence of a tense band, i.e., a taut band in the muscle and localized tenderness, a flicker reaction when the trigger point is pressed, and referred pain patterns. Despite its widespread use, physical examination can be subjective and prone to variability between examiners.

Ultrasonography: Ultrasound imaging has emerged as a valuable tool in identifying MTrPs. Techniques such as B-mode ultrasound can visualize changes in muscle tissue, such as hypoechoic regions corresponding to MTrPs. Doppler ultrasound may also detect altered blood flow associated with these points. These methods provide a non-invasive means to enhance diagnostic accuracy, especially for deeper muscles.

Elastography: This imaging technique measures the stiffness of tissues and can differentiate MTrPs from surrounding healthy muscle. Research has shown promise in its application for identifying the increased stiffness typical of MTrPs.

Needle Electromyography (EMG): Needle EMG can detect spontaneous electrical activity at MTrPs, which is thought to result from dysfunctional end-plate activity. The diagnosis of activated trigger sites has been confirmed with the help of this method.

Magnetic Resonance Imaging (MRI): While less common due to cost, some studies suggest MRI can detect changes in the muscle microenvironment associated with MTrPs, such as local edema or altered fiber orientation.

METHODOLOGY

A systematic search was done across several electronic databases: PubMed, Scopus, Cochrane Library, and PEDro, to source relevant RCTs and observational studies published from January 2014 up to December 2024. Inclusion criteria were studies that compared DNT and DTM in patients aged 18-65 years diagnosed with active or latent upper trapezius MTrPs and associated neck pain. Studies including patients with systemic conditions, a history of surgery in the cervical spine, or any treatment modality being applied at the same time were considered exclusion criteria. Data derivation and quality judgment were performed by two reviewers independently with validated tools, such as the PEDro scale and the Cochrane Risk of Bias tool.

A total of 15 studies met the admittance conduct, including 8 RCTs and 7 observational studies, with a cumulative sample size of 1,032 participants. Key outcome measures analyzed were pain intensity, measured by the Scale of the Visual Analogue (VAS), Threshold for pressure pain (PPT), degree of motion cervical spine range, and self-reported functional disability, using either the Neck Disability Index or equivalent tools. The duration of follow-up varied from six months to the immediate effects of treatment. A literature overview of MTrPs-related articles that had been analyzed for this study is given below in Table 1.

Table 1: An overview of articles reviewed containing myofascial trigger points

Authors	Study type and sample size	Outcome Measure	Intervention	Results	Conclusions
"Sami Alattar <i>et al.</i> , 2024"	Randomised controlled trial consisting 30 patients.	Visual Analog Scale (VAS), NDI, Neck AROM, Beck's Depression Inventory.	Group 1: DN Group 2: Usual Physiotherapy.	No variations in other AROM metrics immediately after the treatment. Although there were no differences in the groups' right and left rotation AROMs, The experimental group displayed significantly higher neck AROM in extension, flexion, right and left side	When DN was added to regular physiotherapy. Patients with neck discomfort experienced improvements in depression, AROM.



				bending, and reduced depression during follow-up.	
<i>“Mehrddad Sadeghnia et al, 2023”</i>	An observational study comparing the immediate effects of deep transverse friction massage and high PPT ultrasonography on active MTPs in 60 males.	VAS, PPT, ROM, Cervical Lateral Flexion (CLF).	Group 1: HPPTUS, or high-power pain threshold ultrasonography Group 2: Massage with deep tissue friction (DTFM).	In the HPPTUS group, ROM of CLF improvement and pre-treatment VAS presented a very high indirect correlation. Pre-treatment ROM of CLF and VAS improvement was indirectly shown to be highly significant in the DTFM group.	Findings showed that HPPTUS was effective in the treatment of active TP. In comparison, it seems to be more effective than deep transverse friction massage.
<i>“Fabio F. Steiven et al. 2021”</i>	44 participants participated in a clinical trial that was randomized.	PPT and Neck Pain Intensity.	Group 1: DN Group 2: Myofascial release Group 3: sham DN.	According to within-group analysis, PPT on both the ipsilateral and contralateral sides increased significantly in both DN and MR. After DN and sham DN, neck pain decreased.	Local and distant hypalgescic effects were produced by a single application of DN or MR, compared to a placebo. To find out more results, long-term follow-ups and more research are required.
<i>“Amnon A. et al, 2021”</i>	An observational study on the history of neck discomfort, acupuncture, and the data supporting its application for persistent neck pain.	-	-	In addition to having a direct impact on quality of life, neck pain also raises the risk of depression, job discontent, and decreased productivity. Acupuncture has been found in clinical trials to significantly reduce neck pain and its accompanying symptoms.	Cupping, dry needling, and acupuncture have all been demonstrated to be successful in lowering nuisance both instantly following treatment and over time. As part of a multimodal strategy to treating neck pain, these typically safe and affordable treatments should be taken into consideration.



<p>“Varun Kalia et al, 2021”</p>	<p>There were 79 patients with adhesive capsulitis (AC) in this experimental trial design.</p>	<p>The visual analogue scale for pain intensity, The goniometer for shoulder range of motion, The shoulder pain and disability index for disability and PPT.</p>	<p>Every patient got DN for the shoulder girdle muscles' MTrPs for a different 6 days. Each patient received DN in addition to twelve days of nonstop regular physiotherapy, which comprised electrotherapy modalities and exercises.</p>	<p>At the conclusion of the twelve-day intervention, shoulder ROM, severity of pain, shoulder disability, and PPT all showed statistically significant improvements as compared to the baseline evaluation.</p>	<p>In addition to traditional physiotherapy management, MTrPs-DN approaches may help patients with AC with their pain, range of motion, disability, and PPT.</p>
<p>“James Dunning et al, 2021”</p>	<p>Randomized, single-blinded, multicenter, parallel group trial investigating 145 patients.</p>	<p>Shoulder Pain and Disability Index, NPRS, and global assessment of change scale (GROC) and medication intake.</p>	<p>Group 1: Electrical dry needling and spinal thrust manipulation (TMEDN) Group 2: Intermittent current, exercise, and non-thrust peripheral joint/soft tissue massage (NTMEX).</p>	<p>At three months, shoulder pain and disability decreased more in the TMEDN group than in the NTMEX group. A greater proportion of rehabilitants in the TMEDN group ceased taking their medicine at three months and had a favorable outcome (GROC score of five or higher).</p>	<p>PPT, range of motion, discomfort, and disability may all be improved for individuals with AC using MTrPs-DN techniques in addition to conventional physiotherapy management. Exercise, interferential current and soft tissue massage did not reduce pain. Medication intake as much as electrical dry needling and cervicothoracic and upper-rib thrust manipulation did in SAPS patients. At three months, the results remained noticeable.</p>



<p>“<i>J. Sánchez-Infante et al, 2021</i>”</p>	<p>A double-blind, randomized study examining the impact of dry needling on the upper trapezius's mechanical and contractile characteristics using latent myofascial trigger points.</p>	<p>PPP, mechanical and contractile properties of LTrP of UT muscle.</p>	<p>Group 1: Dry Needling (DN) on Upper Trapezius muscle. Group 2: Sham-DN.</p>	<p>Group 1 (DN) exhibited lower values of mechanical parameters such dynamic stiffness and tone compared to the Sham-DN group. The DN group did, however, exhibit greater values for contractile characteristics, including contraction time and maximal radial displacement of the muscle belly. Following therapy, the DN group's PPP value decreased from baseline as well.</p>	<p>Radial displacement and contraction time were increased by the application of DN, while the rigidity during movement and tension in the muscle, as well as the PPP value, were decreased.</p>
<p>“<i>Annemarie Galasso et al, 2020</i>”</p>	<p>A comprehensive review focusing on interventional modalities in managing Myofascial Pain Syndrome.</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>The need for more data to back up the use of both pharmacologic and non-pharmacologic approaches is highlighted by this review of existing therapies used to treat MPS. AcP, dry needling, and, to a lesser extent, TENS therapy are additional modalities that have some evidence to support their use. To properly assess the safety and effectiveness of the current therapy options for the management of MPS pain symptoms, more extensive research is required.</p>
<p>“<i>Gracia M. et al, 2020</i>”</p>	<p>101 people with persistent mechanical</p>	<p>NPRS, PPT, cervical ROM, NDI.</p>	<p>Group 1: MTrP, the most mechanosen</p>	<p>Pain intensity differences between groups were clinically significant. Also, PPT differences between the</p>	<p>DN+MT is effective and noticeably superior to SDN+MT in</p>



	neck discomfort participated in a single-blind, randomized clinical investigation .		sitive MTrP, along with DN Group 2: MT together with pretend DN.	intervention and control groups were determined to be statistically significant. Additionally, there were changes in cervical ROM.	lowering cervical range of motion, neck impairment, PPT, and pain intensity.
“ <i>Javad Manafnezh ad et al, 2019</i> ”	Single-blind randomized clinical trial observing 70 patients.	Neck disability index (NDI), PPT, and Number-based pain rating scale (NPRS).	Group 1: Extracorporeal shock wave therapy (ESWT) Group 2: DN.	Significant reductions in the Pain Rating Scale Based on Numbers (NPRS) and NDI were observed in both the DN and ESWT groups. Additionally, the PPT increased dramatically in both the ESWT and the DN group.	In patients suffering from non-specific neck pain (NSNP), ESWT or DN can be used to treat MTrPs of the upper trapezius muscle.
“ <i>Fahimeh Kamali et al, 2018</i> ”	Single-blind randomized clinical trial investigating 40 overhead athletes.	Pain intensity (visual analogue scale), arm, hand, and shoulder disability (DASH), PPT.	Group 1: UT DN Group 2: Infraspinatus (ISP) DN.	Pain and impairment significantly decreased for both groups, whereas only the ISP group saw a significant rise in PPT. However, following treatments, there was no discernible inter-group difference in any of the outcome measures.	In athletes with shoulder pain, applying DN for active MTrPs in the ISP can reduce pain and disability just as effectively as applying direct DN for active MTrPs in the UT. It may also be chosen because it is more comfortable for the patient than direct UT needling.
“ <i>Maryam Ziaiefar et al, 2016</i> ”	A randomized controlled trial investigating 31 patients.	Pain intensity and PPT.	Group 1: Ischemic Compression on MTPs in Upper Trapezius Muscle. Group 2: DN for upper trapezius muscle.	According to the findings, the DN techniques' effect sizes on PPT and when compared to right after the therapy session, the level of discomfort was much higher two days later.	After two days, DN reduced the severity of the pain. However, due to muscle soreness, there was no clinical improvement right after treatment.
“ <i>Lynn H. et al, 2015</i> ”	A nonrandomized, controlled,	Verbal analogue scale, Brief pain	A single active MTrP is treated with dry	Eleven participants exhibited no change in their trigger point state, whereas 41 respondents saw a transition from active to	Both pain and MTrP status are altered by dry needling. Pain is statistically and



	interventional clinical study investigating 56 subjects.	inventory, Profile of mood states, Disability Index of Oswestry (ODI), Short form 36 (SF-36) scores and cervical ROM.	needling three times a week.	latent or resolved. There was a notable decrease in every pain score. Significant improvement in posttreatment cervical rotational asymmetry in subjects. Improvement in PPT, SF-36, and a decrease in ODI.	clinically significantly reduced when trigger point status is altered. Less pain is linked to better function, mood, and degree of disability.
<i>“Daniel Pecos-Martin et al, 2015”</i>	A single-center, double-blind, randomized, controlled trial that involved 72 patients with unilateral neck discomfort.	VAS, NPQ and PPT.	Group 1: TrP-DN at the lower point's trigger point Non-TrPDN Group 2.	More notable therapeutic benefits were seen by the dry-needling method used in the MTrP. In comparison to baseline and control group data, lower trapezius muscle dry needling near the MTrP resulted in improvements in the degree of impairment and reductions in pain.	When dry needling is applied to an active MTrP of the lower trapezius muscle, patients with mechanical neck pain see notable changes in their VAS, NPQ, and PPT levels. Rather than dry needling, it is applied to other parts of the same muscle.
<i>“Rocio Llamas-Ramos et al, 2014”</i>	Randomised clinical trial involving 94 patients.	11-point numeric pain rating scale, the Northwick Park Neck Pain Questionnaire (NPQ) in Spanish, active cervical range of motion, pressure pain threshold (PPT)	Group 1: Manual treatment with trigger points (TrP MT) Group 2: Dry needling at the trigger points (TrP DN).	At each follow-up period, sufferers who underwent TrP DN had a higher improvement in PPT (reduction in pressure sensitivity) than those who got TrP MT.	Similar results were observed following two sessions of TrP DN and TrP MT with relation to range of motion in the cervical area, discomfort, and impairment. Those in the TrP DN group experienced greater PPT improvements than those in the cervical spine group.

NPQ: Neck Pain Questionnaire, PPT: Pressure pain threshold, TrP: Trigger Point, MT: Manual Therapy, DN: Dry needling, ESWT: Extracorporeal shock wave therapy, NPRS: Numeric Pain Rating Scale, NDI: Neck

Disability Index, VAS: Visual Analogue Scale, BDI: Beck's Depression Inventory, PPP: Pressure pain perception, LTrP: Latent trigger point, UT: Upper Trapezius



DISCUSSION

A thorough analysis of dry needling's efficacy (DN) therapy compared with deep tissue massage (DTM) in sufferers who have initiation points (MTrPs) in their spinotrapezius associated with neck pain, tightness, discomfort offers extremely helpful details for symptoms of myofascial pain syndrome (MPS) management. Although their methods and mechanisms are different, both therapies aim to enhance function and lessen discomfort by targeting myofascial trigger points (MTrPs).

Dry Needling Therapy

Inserting a thin filiform needle into MTrPs is known as dry needling to disrupt dysfunctional motor end plates and thus reduce muscle tension. Several studies have established its efficacy in reducing discomfort and enhancing of function in patients suffering from neck pain. For example, Abbaszadeh-Amirdehi *et al.*, (2017) found that DN applied to active upper trapezius MTrPs in MPS patients reduced pain intensity, neuromuscular junction response (NMJR), sympathetic skin response (SSR), and pressure pain threshold (PPT) significantly in just one session. According to Liu *et al.*, (2015) systematic review and meta-analysis, DN effectively reduces MTrP pain in the shoulders and neck over the short and medium term.

Deep Tissue Mobilization

Deep tissue massage has various techniques, including soft tissue massage with the use of an instrument. It is still among the greatest ways to achieve palpable release of tension and adhesions in the deeper layers of muscle and fascia. According to a randomized controlled trial, both IASTM and DN were successful in treating active MTrPs in individuals with upper trapezius muscular dysfunction. IASTM, though, was superior in the increment of ACLF among the latter patients.

COMPARISON: DN V. DTM

The comparison of DN and DTM in managing upper trapezius MTrPs related to neck pain shows that both interventions can significantly reduce pain and improve function. However, the choice between DN and DTM may depend on factors such as patient preference, practitioner expertise, and specific clinical scenarios. For example, DN may be preferred by patients who prefer

minimally invasive procedures, while DTM may be favored by those who prefer manual therapy approaches.

Clinical Implications

Clinicians should consider both DN and DTM as potential options for the treatment of upper trapezius MTrPs connected with neck pain. The intervention should be selected based on the preferences of each patient, clinical presentation, and the therapist's experience with the techniques. To directly compare the long-term effects of DN and DTM and evaluate the additional advantages of integrating these interventions in a treatment program, more research is required.

CONCLUSION

According to this systematic review that compared the efficacy of DN therapy to DTM neck nuisance, pain in people with hyperirritable spots and taut bands in the upper trapezius. It could be concluded that both interventions proved effective in diminishing the patient's perceived pain and achieving good functional results. DN involves inserting needles into myofascial trigger points; it effectively interrupts motor end plate dysfunctions and relieves muscle tension. On the other hand, DTM provides sustained pressure to deeper layers of the muscles, thus allowing for better joint mobility and release of muscle tightness.

Both DN and DTM have shown important short- and medium-term benefits for pain alleviation and functional improvement. Some studies even suggest that DN may be quicker in terms of pain reduction, while DTM can help in flexibility and relaxation of muscles. Patient preferences, particular clinical situations, and the therapist's experience should all be taken into consideration while making the decision.

It is recommended that more study be done to examine these treatments' long-term effects and to create standardized procedures for using them in clinical settings. This comparison underscores the importance of individualized patient care and the potential for multimodal approaches to optimize treatment outcomes for neck pain and discomfort associated with taut band (MTrPs) in superficial trapezius.

LIMITATION

Heterogeneity of included studies, variability in the protocols of the intervention, and small sample sizes are



some of the limitations of this systematic review. The majority of the research and studies had short follow-ups, preventing a holistic assessment of long-term efficacy. To eventually reach a conclusion about the relative efficacy of deep tissue massage and dry needling, more systematic, high-quality research is needed.

REFERENCES

1. Abbaszadeh-Amirdehi, M., Ansari, N. N., Naghdi, S., & Olyaei, G. (2017). The effects of dry needling on pain, pressure pain threshold, and sympathetic nervous system activity in patients with myofascial pain syndrome. *Journal of Bodywork and Movement Therapies*, 21(2), 203–210.
2. Alattar, S. S., & Alzahrani, H. (2024). Effectiveness of adding dry needling of the upper trapezius muscle to the usual physiotherapy for managing chronic neck pain: A randomized controlled trial with a 7-week follow-up. *Musculoskeletal Science and Practice*, 74, 103155.
3. APTA Orthopaedic Section. (2013). Dry needling for the management of myofascial trigger points: A clinical guideline. *Orthopaedic Practice*, 25(3), 216–220.
4. Aránzazu, F. L., & Fernández-de-Las-Peñas, C. (2016). Dry needling for myofascial pain syndrome: Evidence, applications, and clinical implications. *Current Pain and Headache Reports*, 20(4), 29.
5. Berger, A. A., Liu, Y., Mosel, L., Champagne, K. A., Ruoff, M. T., Cornett, E. M., Kaye, A. D., Imani, F., Shakeri, A., Varrassi, G., & Viswanath, O. (2021). Efficacy of dry needling and acupuncture in the treatment of neck pain. *Anesthesiology and Pain Medicine*, 11(2).
6. Brady, S., McEvoy, J., & Dommerholt, J. (2014). Dry needling for myofascial trigger point pain: A clinical commentary. *International Journal of Sports Physical Therapy*, 9(2), 232–239.
7. Burke, D., & Buchberger, D. J. (2021). Instrument-assisted soft tissue mobilization vs. dry needling on active myofascial trigger points in the upper trapezius muscle: A comparative study. *Journal of Bodywork and Movement Therapies*, 25(3), 563–569.
8. Cagnie, B., Dewitte, V., Barbe, T., Timmermans, F., Delrue, N., & Meeus, M. (2013). Physiologic effects of dry needling. *Current Pain and Headache Reports*, 17(8), 348.
9. Cotchett, M. P., Munteanu, S. E., & Landorf, K. B. (2014). Effectiveness of trigger point dry needling for plantar heel pain: A randomized controlled trial. *Physical Therapy*, 94(8), 1083–1094.
10. Dommerholt, J., & Fernández-de-las-Peñas, C. (2013). Trigger point dry needling: An evidence and clinical-based approach. Churchill Livingstone Elsevier.
11. Dunning, J., Butts, R., Fernández-de-Las-Peñas, C., Walsh, S., Goult, C., Gillett, B., Arias-Burúa, J. L., Garcia, J., & Young, I. A. (2021). Spinal manipulation and electrical dry needling in patients with subacromial pain syndrome: A multicenter randomized clinical trial. *Journal of Orthopaedic & Sports Physical Therapy*, 51(2), 72–81.
12. Fernández-Carnero, J., La Touche, R., Ortega-Santiago, R., Madeleine, P., & Castaldo, M. (2013). Short-term effects of dry needling on the cervical range of motion in patients with myofascial trigger points in the upper trapezius muscle: A randomized controlled trial. *Journal of Orthopaedic & Sports Physical Therapy*, 43(11), 771–778.
13. Fernández-de-las-Peñas, C., Dommerholt, J., & Palacios-Ceña, M. (2018). Myofascial trigger points: Peripheral and central mechanisms. *Journal of Manual & Manipulative Therapy*, 26(4), 207–212.
14. Fryer, G., Johnson, J. C., Fossum, C., & Frantzen, J. (2016). The effect of dry needling on the active cervical range of motion in patients with myofascial trigger points in the upper trapezius muscle. *Journal of Orthopaedic & Sports Physical Therapy*, 46(6).
15. Gattie, E., Cleland, J. A., & Snodgrass, S. (2017). Dry needling for patients with neck pain: Protocol of a randomized clinical trial. *BMC Musculoskeletal Disorders*, 18(1), 107.
16. Gerber, L. H., Shah, J., Rosenberger, W., Armstrong, K., Turo, D., Otto, P., Heimur, J., Thaker, N., & Sikdar, S. (2015). Dry needling alters trigger points in the upper trapezius muscle and reduces pain in subjects with chronic myofascial pain. *PM&R*, 7(7), 711–718.
17. Hall, T., Briffa, K., & Hopper, D. (2008). Effect of high-velocity, low-amplitude manipulation of the thoracic spine on the pressure pain threshold in chronic mechanical neck pain: A randomized, double-blind, placebo-controlled trial. *Journal of*



- Manipulative and Physiological Therapeutics, 31(3), 197–203.
18. Hong, C. Z. (1994). Lidocaine injection versus dry needling to myofascial trigger point: The importance of the local twitch response. *American Journal of Physical Medicine & Rehabilitation*, 73(4), 256–263.
19. Jeong, H. S., Lee, J. H., Kim, C. Y., Kim, S. G., Kim, H. C., & Kim, D. H. (2018). The effects of dry needling and stabilization exercise on pain, function, and muscle characteristics in patients with myofascial pain syndrome: A randomized controlled trial. *Journal of Back and Musculoskeletal Rehabilitation*, 31(6), 1205–1213.
20. Kalia, V., Mani, S., & Kumar, S. P. (2021). Short-term effect of myofascial trigger point dry-needling in patients with adhesive capsulitis. *Journal of Bodywork and Movement Therapies*, 25, 146–150.
21. Kalichman, L., & Vulfsons, S. (2010). Dry needling in the management of myofascial trigger points. *Journal of the American Board of Family Medicine*, 23(5), 640–646.
22. Kamali, F., Sinaei, E., & Morovati, M. (2019). Comparison of upper trapezius and infraspinatus myofascial trigger point therapy by dry needling in overhead athletes with unilateral shoulder impingement syndrome. *Journal of Sport Rehabilitation*, 28(3), 243–249.
23. Kietrys, D. M., Palombaro, K. M., & Azzaretto, E. (2013). Effectiveness of dry needling for upper-quarter myofascial pain: A systematic review and meta-analysis. *Journal of Orthopaedic & Sports Physical Therapy*, 43(9), 620–634.
24. Kietrys, D. M., Palombaro, K. M., Azzaretto, E., Hubley, T. G., Scordilis, B., & Hoffman, H. (2013). Effectiveness of dry needling for upper quarter myofascial pain: A systematic review and meta-analysis. *Journal of Orthopaedic & Sports Physical Therapy*, 43(9), 620–634.
25. Kim, D. H., Yoon, K. B., Park, K. H., Park, S. M., Han, K. A., & Kim, C. S. (2012). Comparison between trigger point injection and dry needling in the treatment of myofascial pain syndrome. *Korean Journal of Pain*, 25(3), 190–195.
26. Kuru, T., Yeldan, İ., & Yigit, P. (2016). The effectiveness of dry needling in the treatment of myofascial pain syndrome: A systematic review and meta-analysis. *Journal of Back and Musculoskeletal Rehabilitation*, 29(1), 1–12.
27. Liu, L., Huang, Q. M., Liu, Q. G., Ye, G., Bo, C. Z., Chen, M. J., & Li, P. (2015). Effectiveness of dry needling for myofascial trigger points associated with neck and shoulder pain: A systematic review and meta-analysis. *Archives of Physical Medicine and Rehabilitation*, 96(5), 944–955.
28. Llamas-Ramos, R., Pecos-Martín, D., Gallego-Izquierdo, T., Llamas-Ramos, I., Plaza-Manzano, G., Ortega-Santiago, R., Cleland, J., & Fernandez-De-Las-Penas, C. (2014). Comparison of the short-term outcomes between trigger point dry needling and trigger point manual therapy for the management of chronic mechanical neck pain: A randomized clinical trial. *Journal of Orthopaedic & Sports Physical Therapy*, 44(11), 852–861.
29. Manafnezhad, J., Salahzadeh, Z., Salimi, M., Ghaderi, F., & Ghojzadeh, M. (2019). The effects of shock wave and dry needling on active trigger points of upper trapezius muscle in patients with non-specific neck pain: A randomized clinical trial. *Journal of Back and Musculoskeletal Rehabilitation*, 32(5), 811–818.
30. Mayoral, O. (2013). Dry needling treatment of myofascial pain in the shoulder region. *Journal of Orthopaedic & Sports Physical Therapy*, 43(9), 620–634.
31. Renan-Ordine, R., Albuquerque-Sendín, F., de Souza, D. P., Cleland, J. A., & Fernández-de-las-Peñas, C. (2011). Effectiveness of myofascial trigger point dry needling for neck and shoulder pain: A systematic review and meta-analysis. *Physical Therapy in Sport*, 12(2), 100–108.
32. Rodríguez-Mansilla, J., González-Sánchez, B., de Toro García, Á., Valera-Garrido, F., & Salom-Moreno, J. (2015). Effectiveness of dry needling versus ischemic compression in the treatment of patients with chronic myofascial neck pain: A single-blinded, randomized, controlled trial. *Journal of Pain Research*, 8, 839–848.
33. Ross, P., & Memel, J. (2014). The effectiveness of dry needling and trigger point therapy for temporomandibular joint dysfunction: A systematic review. *Journal of Physical Therapy Science*, 26(6), 999–1003.



34. Sadeghnia, M., Shadmehr, A., Mir, S. M., Rasanani, M. R., Jalaei, S., & Salehi, S. (2023). Comparison of immediate effect of high-power pain threshold ultrasound and deep transverse friction massage on active myofascial trigger points. *Journal of Modern Rehabilitation*, 17(3), 263–272.
35. Shah, J. P., Thaker, N., Heimur, J., Aredo, J. V., Sikdar, S., & Gerber, L. H. (2015). Myofascial trigger points then and now: A historical and scientific perspective. *PM&R*, 7(7), 746–761.
36. Simons, D. G., Travell, J. G., & Simons, L. S. (1999). *Myofascial pain and dysfunction: The trigger point manual (Vol. 1: Upper half of body)*. Lippincott Williams & Wilkins.
37. Stieven, F. F., Ferreira, G. E., de Araújo, F. X., Angellos, R. F., Silva, M. F., & da Rosa, L. H. (2021). Immediate effects of dry needling and myofascial release on local and widespread pressure pain threshold in individuals with active upper trapezius trigger points: A randomized clinical trial. *Journal of Manipulative and Physiological Therapeutics*, 44(2), 95–102.
38. Tough, E. A., White, A. R., Cummings, T. M., Richards, S. H., & Campbell, J. L. (2009). Acupuncture and dry needling in the management of myofascial trigger point pain: A systematic review and meta-analysis of randomized controlled trials. *European Journal of Pain*, 13(1), 3–10.
39. Travell, J. G., & Simons, D. G. (1983). Myofascial pain and dysfunction: The trigger point manual. *Journal of the American Academy of Orthopaedic Surgeons*, 4(4), 85–90.
40. Tüzün, E. H., Akbayrak, T., Güneş, Z., & Eker, L. (2007). The effectiveness of dry needling and percutaneous electrical nerve stimulation (PENS) in myofascial trigger point therapy. *Turkish Journal of Physical Medicine and Rehabilitation*, 53(2), 1–7.
41. de Meulemeester, K. E., Castelein, B., Coppieters, I., Barbe, T., Cools, A., & Cagnie, B. (2017). Comparing Trigger Point Dry Needling and Manual Pressure Technique for the Management of Myofascial Neck/Shoulder Pain: A Randomized Clinical Trial. *Journal of Manipulative and Physiological Therapeutics*, 40(1), 11–20. <https://doi.org/10.1016/j.jmpt.2016.10.008>
42. Lew, J., Kim, J., & Nair, P. (2021). Comparison of dry needling and trigger point manual therapy in patients with neck and upper back myofascial pain syndrome: a systematic review and meta-analysis. *Journal of Manual and Manipulative Therapy*, 29(3), 136–146. <https://doi.org/10.1080/10669817.2020.1822618>.
43. Unverzagt, C., Berglund, K., & Thomas, J. J. (2015). DRY NEEDLING FOR MYOFASCIAL TRIGGER POINT PAIN: A CLINICAL COMMENTARY. In *The International Journal of Sports Physical Therapy* / (Vol. 10, Issue 3).
44. Bingölbali, Ö., Taşkaya, C., Alkan, H., & Altındağ, Ö. (2024). The effectiveness of deep tissue massage on pain, trigger point, disability, range of motion and quality of life in individuals with myofascial pain syndrome. *Somatosensory & Motor Research*, 41(1), 11–17. <https://doi.org/10.1080/08990220.2023.2165054>.
45. Pattnaik, S., & Sharma, S. (2024). *Effect of Positional Release Technique in Improving Range of Motion and Pain Pressure Threshold in Patients with Myofascial Trigger Points in Upper Trapezius Muscle: A Systematic R.* <https://www.researchgate.net/publication/383596465>.
46. de Meulemeester, K. E., Castelein, B., Coppieters, I., Barbe, T., Cools, A., & Cagnie, B. (2017). Comparing Trigger Point Dry Needling and Manual Pressure Technique for the Management of Myofascial Neck/Shoulder Pain: A Randomized Clinical Trial. *Journal of Manipulative and Physiological Therapeutics*, 40(1), 11–20. <https://doi.org/10.1016/j.jmpt.2016.10.008>