SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

DIAGNOSIS AND REHABILITATION OF MYOFASCIAL PAIN SYNDROME OF THE NECK AND SHOULDER GIRDLE IN INDIVIDUALS WITH OCCUPATIONAL RISK

Ikram Ummatovich Djurayev[1], Zilola Farkhadovna Mavlyanova[2], Olga Anatolyevna Kim[3], Sayfiddin Farkhodovich Mavlyanov[4], Rustamjon Furkatovich Ashurov[5]

[1]*https://orcid.org/0009-0001-8956-9839*
[2]*https://orcid.org/0000-0001-7862-2625*
[3] *https://orcid.org/0000-0003-1987-9505*
[4]*https://orcid.org/0009-0005-9344-5627*
[5]*https://orcid.org/0009-0003-2232-7696*
Samarkand State Medical University

Article DOI: https://doi.org/10.36713/epra26333
DOI No: 10.36713/epra26333

ABSTRACT

Background: Neck and shoulder disorders may be linked to the presence of myofascial trigger points (MTrPs). These disorders can significantly impact a person's activities of daily living and ability to work. MTrPs can be involved with pain sensitization, contributing to acute or chronic neck and shoulder musculoskeletal disorders. The aim of this review was to synthesise evidence on the prevalence of active and latent MTrPs in subjects with neck and shoulder disorders.

Methods: We conducted an electronic search in five databases. Five independent reviewers selected observational studies assessing the prevalence of MTrPs (active or latent) in participants with neck or shoulder disorders. Two reviewers assessed risk of bias using a modified Downs and Black checklist. Subject characteristics and prevalence of active and latent MTrPs in relevant muscles was extracted from included studies.

Results: Seven articles studying different conditions met the inclusion criteria. The prevalence of MTrPs was compared and analysed. All studies had low methodologic quality due to small sample sizes, lack of control groups and blinding. Findings revealed that active and latent MTrPs were prevalent throughout all disorders, however, latent MTrPs did not consistently have a higher prevalence compared to healthy controls.

Conclusions: We found limited evidence supporting the high prevalence of active and latent MTrPs in patients with neck or shoulder disorders. Point prevalence estimates of MTrPs were based on a small number of studies with very low sample sizes and with design limitations that increased risk of bias within included studies. Future studies, with low risk of bias and large sample sizes may impact on current evidence.

KEYWORDS: *Shoulder pain, Neck pain Trigger point, Myofascial pain Trigger point, Rotator cuff muscle*

BACKGROUND

Neck and shoulder pain are common complaints that may significantly impact a person's activities of daily living and their ability to work [1]. In New Zealand, shoulder pain is the third most common musculoskeletal condition. Neck pain is the 4th highest condition in terms of years lived with disability [2]. Within New Zealand, ACC reports the 12-month prevalence estimates for neck pain in the adult population lie between 30 and 50%, and accounts for 15% of the global burden of disease [2].

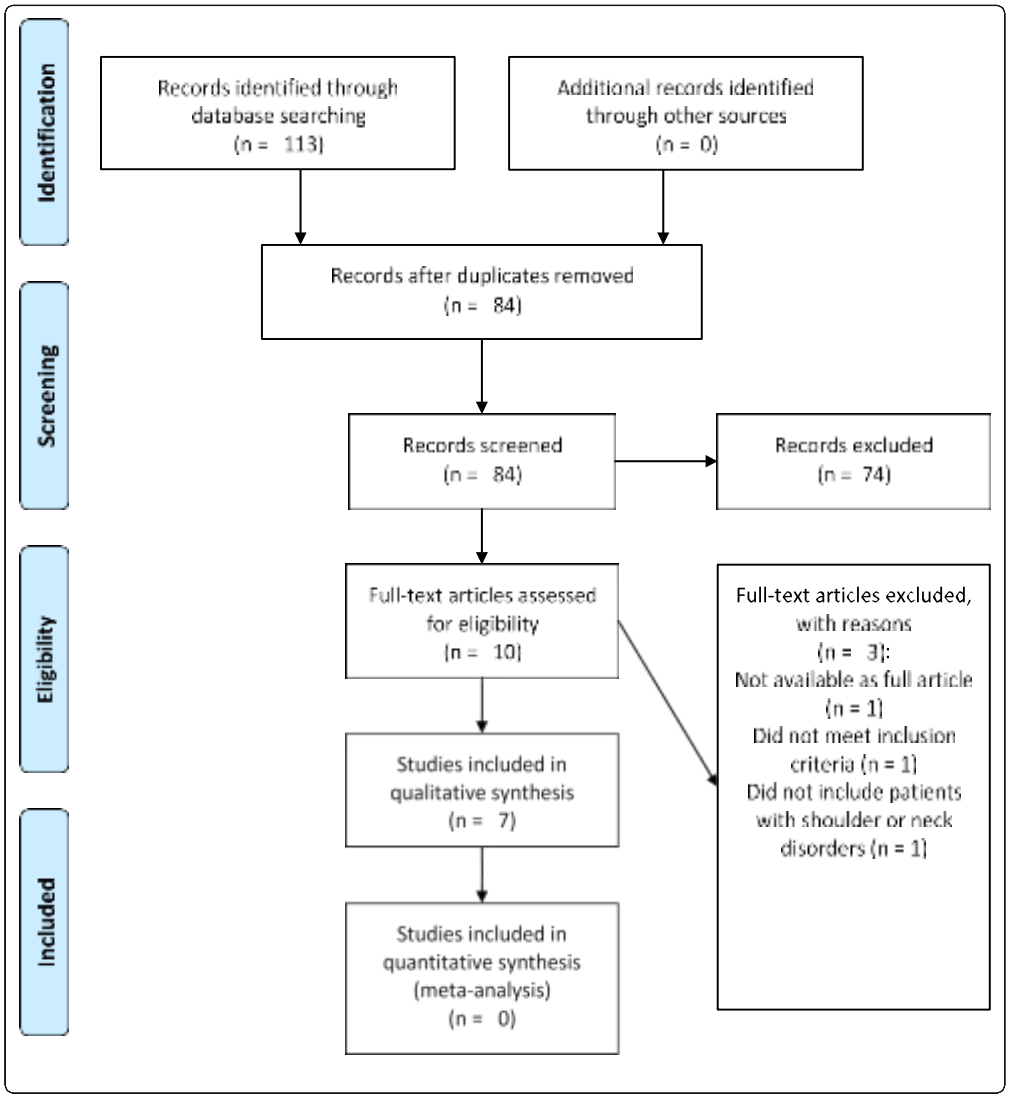
Myofascial trigger points (MTrPs) are considered to be hypersensitive, tender areas over a taut band of muscle [3].
They are palpable, produce localised and referred pain to other structures with mechanical stimulation [4, 5]. MTrPs can be further differentiated as active or latent [3]. Active and latent MTrPs elicit local and referred pain, however active MTrPs also reproduce patient symptoms, whereas latent MTrPs do not [3, 4, 6]. Latent MTrPs may later become active [3, 7]. It is considered that both active and latent MTrPs can cause muscle imbalances, weakness and impaired motor recruitment, disrupting muscle function, and exposing joint to suboptimal loading [8].

The theory of trigger points causing myofascial pain syn- drome is controversial with limited external validity to sup- port it [9]. Despite that, physiotherapy interventions commonly target MTrPs [10, 11]. Active and latent MTrPs may contribute to neck and shoulder pain symptoms [12].

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

In a study with small sample size, active MTrPs were found to present higher concentration of inflammatory mediators, neuropeptides, cytokines, and catecholamines if compared to latent MTrPs or other body regions with no MTrPs [13]. Latent MTrPs were found to impact on motor recruitment patterns [14], accelerate fatigue [15] in agonist muscles, and seem to be linked to increased muscle activity of antagonist muscles [16].

Patients with chronic, non-traumatic neck and shoul- der pain were found to have higher prevalence of MTrPs when compared to healthy controls, with different distri- butions between muscles of two opposing anatomical structures [12]. For example, active MTrPs were preva- lent in the infraspinatus and upper trapezius muscles, whilst latent MTrPs were prevalent in the teres major and anterior deltoid muscles [12]. Studies investigating shoulder impingement have reported active MTrPs in infraspinatus, subscapularis, supraspinatus, and pectora- lis major muscles [17]. Together, these findings suggest that MTrPs are likely to be present in different shoulder and neck disorders, and may vary in muscle distribution and type (i.e. active or latent).



Knowledge of MTrP common locations at the neck; and shoulder can help clinicians to optimally prescribe interventions to manage neck and shoulder disorders. To our knowledge no previous systematic review sum- marized findings from and assessed the methodological quality of studies assessing the prevalence of MTrPs in the upper quadrant (i.e. neck and shoulder disorders). A previous review focused on spinal disorders only, with- out assessing patients with shoulder disorders [18]. Given the link between these structures (i.e. neck, scap- ula and shoulder), we deemed appropriate to conduct a systematic review assessing the upper quadrant. There- fore, the objective of this study was to synthesize the current evidence on the prevalence of active and latent MTrPs in subjects with acute or chronic neck and shoulder disorders. The specific aims were to: (1) iden- tify the prevalence of MTrPs in neck, scapular and shoulder muscles; and (2) compare the prevalence of MTrPs in subjects with diagnosed acute or chronic neck or shoulder-related disorders to healthy controls.

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

Methods: Study retrieval and screening

A comprehensive literature search of databases including CINAHL, Embase, Pubmed, Scopus and Web of Science was completed on August 12, 2017. The search strategy used is presented in Table 1. Screening of reference lists from included studies was also performed. Articles were then exported into Endnote and duplicates were re- moved. The retrieved articles were screened for eligibility by title, followed by full-article screening. There was no attempt to access unpublished studies or supplementary 'grey' literature.

Initially, two independent reviewers screened articles by titles, and a third reviewer was available if consensus was not achieved. Full texts of potential eligible studies were retrieved and assessed independently against the inclusion criteria by two reviewers (A.B., and P.M.). Dis- crepancies between reviewers regarding full text eligibil- ity were resolved in a consensus meeting and a third reviewer (DCR) was consulted.

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	
Alonso-Blanco et al., 2011	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✗	Low
Bron et al., 2011	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	Low
Fernández-De-Las- Peñas, 2012	✓	✓	✓	✓	✓	✓	✓	✗	?	✓	✓	✓	✓	✗	?	✓	Low
Fernandez-Perez, 2012	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	?	✓	Low
Hilalgo-Lozano et al., 2010	✓	✓	✓	✓	✓	✓	✓	?	?	✓	✓	✓	✓	✗	?	✗	Low
Sari et al., 2012	✓	✓	✓	✗	✓	✓	✓	?	?	✗	✓	✓	✓	?	?	✗	Low
Tali et al., 2014	✓	✓	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	?	Low

Abbreviations: ✓, yes ✗, no?, unable to determine

Reporting Bias External Validity Internal validity Power Risk of bias

Abbreviations: ✓, yes ✗, no?, unable to determine

Eligibility Criteria

The following study designs were included in this re- view: (1) full-text articles published in a peer-reviewed scientific journal; (2) observational, cross-sectional, or prospective studies assessing the prevalence of active and/or latent MTrPs in at least one group of adult sub- jects (> 18 years old) with a shoulder, scapular, or neck disorder (as diagnosed by the original study); and (3) inclusion of manual assessment of MTrPs in at least one specific neck, scapular or shoulder muscle. Articles in any languages and medical diagnoses indicating the presence of shoulder, scapular, or neck were accepted and included in this review. All study designs other than the aforementioned were excluded, unless randomised control trials included the prevalence of MTrPs as a baseline measurement.

Risk of bias within included studies

A modified Downs and Black checklist [19] was used to assess the risk of bias within included studies. This checklist is a 27 item checklist; however, 11 items were excluded as these were not applicable for this systematic review. Each study was assessed independently by 2 reviewers. Disagreements were resolved through consen- sus, if consensus was not reached, then a third author (D.R) was consulted. Studies scoring 50% or more were considered to have low risk of bias; whilst studies pre- senting with a Downs and Black score lower than 50% were considered to have a high risk of bias. For the pur- pose of this review, we arbitrarily selected a 50% cut-off. This threshold been used by a previous systematic review assessing observational studies [18].

Data Extraction

Characteristics from each study and additional patient and control group information were extracted and recorded. The proportion of participants with active/la- tent MTrPs in all assessed muscles were documented from each study. When available, we extracted informa- tion regarding the duration of the condition (i.e. acute or chronic). The data was independently extracted by two reviewers, and double-checked for accuracy.

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

Data Analysis

As each included study analysed a different disorder, it was not possible to conduct a meta-analysis. Therefore, a narrative discussion of findings is presented.

Results

The flow of studies in the review is presented in Fig. 1. Seven articles were included in this systematic review, with a sample size of 433 participants. Four studies had a cross-sectional design, while three studies used a case-control design.

Risk of bias within included studies

The risk of bias within included studies is presented in Table 2. Overall, studies were considered as having low risk of bias. There is some risk of bias for external valid- ity. For example, subjects were considered as not repre- sentative of the entire population in three studies, and it was not possible to determine this in two studies (Item 8, Table 2). Risk of bias for internal validity was mainly due to participants not being recruited from the same population (Item 14 – Table 2) or due to lack of clarity about the recruitment period (not clear in four studies – Item 15, Table 2). Finally, three studies did not estimate sample size a priori.

Characteristics of included studies

The included studies analysed the following disorders: chronic tension-type headache, chronic non-traumatic unilateral shoulder pain, non-specific upper quadrant pain, acute whiplash disorder, unilateral shoulder impingement syndrome and episodic migraine. For each disorder, MTrP prevalence was assessed in different mus- cles (e.g. upper trapezius, supraspinatus, sternocleidomas- toid) (Table 3). The characteristics of the subjects included in the studies is presented in Table 4, and the point prevalence of active MTrPs in subjects with shoul- der or neck disorders is presented in Table 5.

Chronic Tension-Type Headache

Alonso-Blanco et al. (2011) analysed the prevalence of ac- tive MTrPs in dominant and non-dominant temporalis, upper trapezius, sternocleidomastoid (SCM), and bilateral suboccipital muscles [5]. The sample contained 20 adults and 20 children with chronic tension-type headache. Re- sults showed adults had a significantly ($p = 0.001$) higher number of active MTrPs (4, SD = − 0.8) than children (3, SD = − 0.7). Significant differences in the distribution of active MTrPs between adults and children were found in the dominant upper trapezius ($p < 0.001$), and the non-dominant SCM ($p = 0.032$) muscles. This study had some external validity and power bias.

Table 3 Characteristics of included studies

Study	Study design	Disorder(s)	Healthy Controls Group	Diagnostic Criteria Active MTrPs	Diagnostic Criteria Latent MTrPs	Assessed Muscles	Country , Setting
Alonso-Blanco et al., 2011	Cross-sectional	CTTH	No	Presence of a palpable taut band in a skeletal muscle. Presence of a hyperirritable sensitive spot within the taut band. Local twitch response elicited by the snapping palpation of the taut band. Presence of referred pain in response to MTrP compression.	Not assessed	Upper Trapezius Sternocleidomastoid Temporalis Suboccipital	Spain, hospital
Bron et al., 2011	Cross-sectional	SP	No	A nodule in a taut band of skeletal muscle. Painful on compression May produce referred pain or sensations Pain recognised by patient as “familiar”	A nodule in a taut band of skeletal muscle. Painful on compression May produce referred pain or sensations Pain not recognizable to patient	Upper/middle/lower trapezius Infraspinatus Supraspinatus Subscapularis Teres minor and major Anterior/middle/ posterior deltoids Pectoralis major and minor	Spain, primary care practice.

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

						Biceps brachii Triceps brachii Scalene Subclavius	
Fernande z-	Cross-	Acute WAD	Yes	Palpable taut band within	Palpable taut band within	Temporalis	Spain, primary
Perez et al., 2012	sectional cohort			a skeletal muscle Presence of a hypersensitive spot in the taut band Local twitch re-sponse elic- ited by the snapping palpa- tion of the taut band Production of referred pain in response to MTrP manual compression. If referred pain of symptoms reported by the patient is recognized as familiar	a skeletal muscle Presence of a hypersensitive spot in the taut band Local twitch re-sponse elicited by the snapping pal- pation of the taut band Production of referred pain in response to MTrP manual compression. Symptoms produced are not familiar to the patient	Masseter Upper trapezius Levator scapulae Sternocleidomastoid Scalene	care
Fernánde z-	Cross-	Non-specific	No	Presence of a palpable	MTrPs were considered	Temporalis	Spain,
De-Las-Peñas, 2012	sectional	pain		taut band within a skeletal muscle. Presence of a hyperirritable spot in the taut band. Local twitch response elicited by the snapping palpation of the taut band (when possible). Presence of referred pain in response to compression. MTrPs were considered active when the local and referred pains evoked by compression reproduced clinical pain symptoms and also the participant recognized the pain as familiar.	latent when the local and the referred pain elicited by digital compression did not reproduce symptoms familiar to the participant.	Masseter Upper trapezius Sternocleidomastoid Splenius capitis Oblique capitis inferior Levator scapulae Scalene Pectoralis major Deltoid Infraspinatus Extensor carpi radialis brevis Extensor carpi radialis longus Eetensor digitorum communis Supinator	Departm ent of PT, OT, rehab and physical medicine .
	Case-control		Yes			Levator scapulae Supraspinatus	Spain, setting unclear

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

Table 3 Characteristics of included studies (Continued)
Abbreviations: CTTH Chronic tension type headache, SP Shoulder pain, WAD Whiplash associated disorder, MTrP Myofascial trigger point

Study	Study design	Disorder(s)	Healthy Controls Group	Diagnostic Criteria Active MTrPs	Diagnostic Criteria Latent MTrPs	Assessed Muscles	Country, Setting
Hidalgo-Lozano et al., 2010		Unilateral shoulder impingement		Presence of a palpable taut band in a skeletal muscle Presence of a hyperirritable tender spot within the taut band Local twitch response elicited by the snapping palpation of the taut band Presence of referred pain in response to MTrP compression. Local and the referred pain evoked by digital compression reproduced the pain symptoms (both in location and pain sensation) and the subject recognized the pain as familiar pain	Presence of a palpable taut band in a skeletal muscle Presence of a hyperirritable tender spot within the taut band Local twitch response elicited by the snapping palpation of the taut band Presence of referred pain in response to MTrP compression. Local and referred pain elicited by digital compression did not reproduce symptoms familiar to the subjects	Infraspinatus Subscapularis Pectoralis major Biceps brachii	
Sari et al., 2012	Case-control	Cervical Radiculopathy	Yes	Presence of a palpable taut band in a skeletal muscle Presence of hypersensible tender spot in the taut band Local twitch response elicited by the snapping palpation of the taut band Reproduction of the typical referred pain pattern of the MTrP in response to compression; and Spontaneous presence of the typical referred pain pattern and/or patient recognition of the referred pain as familiar. If all of the aforementioned criteria were present the MTrP was considered active	Presence of a palpable taut band in a skeletal muscle Presence of hypersensible tender spot in the taut band Local twitch response elicited by the snapping palpation of the taut band Reproduction of the typical referred pain pattern of the MTrP in response to compression	Trapezius, multifidus, splenius capitis, levator scapulae, rhomboid major, and rhomboid minor	Turkey, Outpatient clinic
Tali et al.,	Case-	Episodic	Yes	Palpable taut band within	Palpable taut band within	Sternocleidomastoid	Israel,

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

2014	control	migraines		a skeletal muscle Presence of a hypersensitive spot in the taut band Local twitch response elicited by the snapping palpation of the taut band Production of referred pain in response to MTrP manual compression. If the MTrP were palpated and produced a headache, familiar or not, it was referred to as an "active MTrP".	a skeletal muscle Presence of a hypersensitive spot in the taut band Local twitch response elicited by the snapping palpation of the taut band Production of referred pain in response to MTrP manual compression. If the MTrP were palpated and produced local or radiated pain it was referred to as a "latent MTrP".	Upper trapezius	Physiotherapy Department

Chronic Non-Traumatic Unilateral Shoulder Pain

Bron et al. (2011) reported on the prevalence of MTrPs in 72 subjects with chronic non-traumatic unilateral shoulder pain [20]. This study analysed the prevalence of MTrPs on upper trapezius, middle trapezius, lower tra- pezius, infraspinatus, supraspinatus, subscapularis, teres minor, teres major, posterior deltoid, middle deltoid, an- terior deltoid, pectoralis major, pectoralis minor, biceps, triceps, scalenes and subclavius muscles. Muscles con- taining active MTrPs were present in all participants, and the median number of MTrPs was 6 (range 2–16) per subject. Latent MTrPs were found in 67 participants with a median of 4 (range 0–11). Active MTrPs were most prevalent in the infraspinatus (n = 56) and the upper trapezius muscles (n = 42); whereas latent MTrPs were most prevalent in the teres major (n = 35), anterior deltoid (n = 27) and upper trapezius (n = 27) muscles. Al- though there was no difference found between left and right sides, this study demonstrated a high prevalence of active and latent MTrPs in muscles of patients with non-traumatic shoulder pain. This study had small reporting and external validity bias.

Non-specific upper quadrant pain

Fernández-De-Las-Peñas et al. (2012) analysed the preva- lence of active MTrPs in the head, neck an d arm between manual (blue collar) and office (white-collar) workers with nonspecific neck or shoulder pain [21]. There was a similar number of MTrPs in the upper quadrant musculature with the most prevalent being upper trapezius, infraspinatus, levator scapulae, and extensor carpi radialis brevis muscles for both groups. No significant difference between groups was found with regards to the distribution of active and latent MTrPs, or the total number ($p = 0.503$) of active ($p = 0.657$) and latent ($p = 0.605$) MTrPs. Manual workers dem- onstrated a mean of 6 (SD = 3) active MTrPs, and 10 (SD = 6) latent MTrPs compared to the 6 (SD = 4) active and 11 (SD = 5) latent MTrPs shown in office workers [21]. This study had some reporting, external and internal valid- ity risk of bias.

Acute Whiplash Disorder

Fernandez-Perez et al. (2012) compared the prevalence of MTrPs in patients with a high level of disability following acute whiplash injuries with healthy controls [22]. The distribution of MTrPs were statistically significant ($p < 0.05$) in the temporalis, upper trapezius, SCM, levator scapulae, scalenes, and suboccipital muscles between patient and healthy control groups. Active MTrPs in levator scapulae ($p = 0.012$) and upper trapezius ($p < 0.01$) muscles were more prevalent in the patient group when compared to healthy controls. When compared to healthy controls participant's suffering from whiplash associated disorder (WAD) had significantly higher prevalence in the mean total number of MTrPs per person (7.3, SD = 2.8). Patients with WAD had a significantly higher number of active MTrPs per person (3.9, SD = 2.5). No active MTrPs were found in healthy controls ($p < 0.001$). Significant differences in latent MTrPs were also observed between groups ($p = 0.002$). Participants with acute WAD had a mean of 3.4 (SD = 2.7) latent MTrPs per person, whereas healthy subjects had a mean of 1.7 (SD = 2.2) [22]. This study had some reporting, external and internal validity risk of bias.

Unilateral Shoulder Impingement Syndrome

Hidalgo-Lozano et al. (2010) assessed the prevalence of MTrPs in 12 patients with unilateral shoulder impinge- ment syndrome compared to healthy controls [17]. On average each patient had 4.5 (SD = 1) MTrPs and of those, 2.5 (SD = 1) were active MTrPs and 2 (SD = 1) were latent. However, no distinction was made between left and right shoulders. Point prevalence of active MTrPs was most predominant in supraspinatus (67%), infraspinatus (42%) and subscapularis (42%). The distri- bution of MTrPs in muscles was also significantly higher in individuals with unilateral shoulder impingement syn- drome in comparison to healthy controls.

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

Differences in MTrPs between healthy controls and symptomatic par- ticipants were reported for the levator scapulae, supras- pinatus, infraspinatus, pectoralis major, and biceps brachii but not subscapularis muscles. Both active and latent MTrPs were present in unilateral shoulder impingement participants with levator scapula (100%), supraspinatus (66%), infraspinatus (83.33%), and subsca- pularis (66%). This study had some reporting, external and internal validity, and power risk of bias.

Cervical Radiculopathy

One study assessed the presence of active and latent MTrPs in patients with cervical radiculopathy [23]. The muscles assessed included trapezius, multifidus, splenius capitis, levator scapulae, rhomboid major, and rhomboid minor. A total of 244 patients where compared to 122 controls. Findings suggest that active MTrPs are more common on patients with cervical radiculopathy than controls. Participants on the control group did not present active MTrPs on assessed muscles. The study also reported no difference between groups (control and cervical radiculopathy) in the distribution of latent MTrPs (p = 0.249).

Table 5 Point prevalence (Expressed as percentage) of active MTrPs in subjects with shoulder or neck disorders This study had some reporting, external and internal validity, and power risk of bias.

	Alonso-Blanco et al., 2011	Bron et al., 2011	Fernandez-Perez et al., 2012	Fernández-De-Las-Peñas, 2012	Hidalgo-Lozano et al., 2010	Sari, 2012	Tali et al., 2014	Hidalgo-Lozano et al., 2010
Sample	AdultsChildren (N = 20) (N = 20)			White collar Blue collar (N = 19) (N = 16)				
Information regarding right or left side		Do not specify left and right			Do not specify left and right	Do not specify left and right		Do not specify left and right
Muscles								
Left Temporalis	55 70		20	5.3 6.3				
Right Temporalis	65 75		10	5.3 6.3				
Right SCM	30 25		5	21.1 6.3			5	
Left SCM	40 10		30	21.1 18.8			10	
Left Upper Trapezius	35 20		30	63.2 56.3		13.5	25	
Right Upper Trapezius	80 15		35	63.2 68.8			45	
Suboccipital muscles	100 80 (bilateral) (bilateral)			OCI- left = OCI- left = 31.6. right = 12.5. right 31.6= 25 SC- left = SC- left = 15.8. right = 31.3. right 21.1 = 37.5				
Middle Trapezius		43.1						
Lower Trapezius		37.5						
Left Infraspinatus		77.8		31.6 37.5	41.7			41.7
Right Infraspinatus				21.1 43.8				
Supraspinatus		34.7			66.7			66.7
Subscapularis		40.3			41.7			41.7
Teres minor		47.2						
Teres major		36.1						
Left Deltoid		Posterior -		5.3 18.8				
Right Deltoid	44.4			10.5 12.5				

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

	Middle- 50 Anterior- 47.2					
Left Pectoralis major	26.4		5.3	18.8	16.7	16.7
Right Pectoralis major			18.8	18.8		
Pectoralis minor	30.6					
Biceps Brachii	20.8				16.7	16.7
Triceps Brachii	19.4					
Left Scalene	16.7	20	21.1	12.5		
Right Scalene		30	15.8	2.3		

Episodic Migraine
Tali et al. (2014) studied two groups with the first (18 women and 2 men) suffering from episodic migraines and the second (17 women and 3 men) being healthy controls [24]. Results from this study revealed an increased number of active MTrPs in the migraine group when compared to healthy controls. No significant difference (p = 0.185) be- tween groups was found for the prevalence of latent MTrPs. That study identified a higher prevalence of MTrPs (active and latent) in the migraine group in the right trapez- ius in comparison to the control group [24]. There was no significant difference in MTrPs between left and right side.

The included studies examined the following musculo- skeletal disorders: chronic tension-type headache [5], uni- lateral shoulder pain [20], upper quadrant pain [21], acute whiplash disorder [22], shoulder impingement syndrome [17], cervical radiculopathy [23], and episodic migraine [24]. Hidalgo-Lozano et al. (2010), Fernandes-de-las-Penas et al. (2012), Fernandes-Perez et al. (2012), and Tali et al. (2014) all compared participants with shoulder or neck dis- orders to healthy controls and found participants with shoulder and neck disorders had a higher prevalence of MTrPs [17, 21, 22, 24]. Active and latent MTrPs are more common in the upper trapezius muscle, with the exception of Fernández-De-Las-Peñas et al. (2012) who found no sig- nificant difference between the distribution on active or la- tent MTrPs [21].

Alonso-Blanco et al. (2011) and Bron et al. (2011)
compared the prevalence of MTrPs between adults and children and the prevalence between right and left shoulders in patients with unilateral shoulder pain re- spectively [5, 20]. Alonso-Blanco et al. (2011) found that adults had higher prevalence of MTrPs than children, whilst in contrast Bron et al. (2011) found no significant differences between symptomatic and asymptomatic shoulders [20].

All studies, with the exception of two [20, 23] had very small samples sizes. Therefore, the generalisability of re- sults is limited. Bron et al. (2011) and Sari et al. (2012) had the two largest sample sizes (72 and 244 patients re- spectively) from all 7 studies [20, 23]. However, Bron et al. (2011) study had 69% female participants and did not in- clude a healthy control group which decreases the signifi- cance of their findings [20]. Bron et al. (2011) and Hidalgo-Lozano et al. (2010) did not differentiate between the prevalence of left and right MTrPs and they did not acknowledge which side was symptomatic [17, 20]. This made interpreting results more difficult and hindered the synthesis of data from multiple studies.

Studies presented limitations regarding sample size and assessor blinding. All studies were considered to have small sample sizes [25]. A small sample size can lead to biased results. Future studies with larger sample sizes should be designed, and estimated a priori, to ensure more reliable and accurate findings. Only four studies ensured practitioners assessing trigger points were blinded. Blind- ing the assessor helps reducing the influence of the asses- sors' perception and believes towards an outcomes measure [26]. Only 4 of the 7 studies included a control group. Find- ings from control groups inform what outcomes are ex- pected within an asymptomatic population. Additionally, the inclusion of a control group helps to control for other variables (e.g. age, occupation), and also accounts for normal biological variations [27]. Future studies should therefore include a control group, to enhance our understanding on the role of MTrPs and musculo- skeletal disorders.

There is lack of consensus on how to define myofascial trigger point pain syndrome [28]. The use of different definitions, or the lack of clarity around MTrPs defin- ition, impact on the external validity of reported find- ings. Included studies used similar (but not always the same) diagnostic criteria for assessing active and latent MTrPs. Currently, the criterion validity of MTrPs diag- nostic criteria is poor, as there is no gold standard for diagnosing MTrP. Therefore, it is unknown what the sensitivity and specificity is when using the clinical cri- teria proposed by Simons et al. [29].

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

The reliability of physical examination for diagnosing MTrP has been questioned in the literature [30]. One study reported excellent test-retest reliability for physical examination when assessing MTrPs in patients with ro- tator cuff disorders [31]. On the other hand, two previ- ous systematic reviews [30, 32] questioned the reliability of physical examination for assessing the presence of MTrP due to low methodological quality of included studies. There is definitely a need for an international consensus for standardizing the assessment of MTrP in clinical practice and research [18].

All studies used very similar definitions to define a MTrP (Table 3). Most used the description from "Myo- fascial Pain and Dysfunction. The trigger point manual. Upper half of body" by Simons et al. [29] The criteria often comprised: 1) presence of a palpable taut band within a skeletal muscle; 2) existence of a hyperirritable spot in the taut band; 3) local twitch response elicited by the snapping palpation of the taut band (when possible); 4) presence of referred pain in response to compression [29]. The criteria for distinguishing between active and latent MTrPs were also defined by Simons et al. [29]. The difference in active and latent MTrPs was found fol- lowing compression of the MTrP. If patient's symptoms were reproduced, it is considered to be an active MTrP; whereas no reproduction of symptoms or production of unfamiliar symptoms is considered latent [20].

The results from this review suggest that active and la- tent MTrPs are highly present in patients with different neck or shoulder disorders. From the 7 included studies, 5 revealed that the upper trapezius was consistently one of the muscles with highest, if not the highest, prevalence of a MTrP. Furthermore, 3 studies examined the prevalence of MTrPs on infraspinatus muscle [17, 20, 21] and, to- gether, these findings suggest that infraspinatus is among one of the most prevalent muscles with active MTrPs across all 3 studies.

All seven studies reported the importance of referred pain mechanism relating to MTrPs, and how it may be an underlying contributing factor to the patient's condi- tion. Alonso-Blanco et al. (2011) found a significantly higher number of active MTrPs in adults and discussed the similarities observed between the presence of active MTrPs and patterns of their headache symptoms [5]. Hidalgo-Lozano et al. (2011) revealed that the referred pain pattern from the active MTrPs of the levator scapu- lae, supraspinatus, infraspinatus, subscapularis, pectora- lis major, and biceps brachii reproduced patient symptoms [17]. This was also in agreement with Dong et al. (2015) and Koester et al. (2005) who reported shoulder impingement often refers pain down to the mid humerus level, further increasing the validity of MTrPs and their impact on the reported symptoms for this disorder [33, 34]. These studies support the idea that high active MTrPs may contribute to patient's symptoms.

Study limitations and previous systematic reviews

We were unable to perform a meta-analysis due to pa- tients with different disorders being included, and differ- ent outcome measures used by the included studies. Due to limited number of articles included in this review, we could not explore differences in the prevalence of MTrPs between acute and chronic conditions. We did not register the protocol of this review, and that in- creases risk of reporting bias of this review. A previous systematic review assessed the prevalence of MTrPs in spinal disorders [18]. Findings from the review support the theory that MTrPs are more prevalent in patients with musculoskeletal disorders.

CONCLUSION

Findings from this systematic review suggest that there is limited evidence supporting the high prevalence of ac- tive and latent MTrPs in patients with neck or shoulder disorders. Point prevalence estimates of MTrPs were based on a small number of studies with very low sam- ple sizes and with design limitations that increased risk of bias within included studies. Therefore, future studies assessing patients neck or shoulder disorders, with large samples and stronger study designs are required to pro- vide more reliable pooled estimates of point prevalence of MTrPs in these patients.

REFERENCES

1. *Greenberg DL. Evaluation and treatment of shoulder pain. Med Clin N Am. 2014;98(3):487–504.*
2. *Hoy D, March L, Brooks P, Blyth F, Woolf A, Bain C, Williams G, Smith E, Vos T, Barendregt J, et al. The global burden of low back pain: estimates from the global burden of disease 2010 study. Ann Rheum Dis. 2014;73(6):968–74.*
3. *Irnich D. Myofascial trigger points: comprehensive diagnosis and treatment: Elsevier Ltd; 2013.*
4. *Rha DW, Shin JC, Kim YK, Jung JH, Kim YU, Lee SC. Detecting local twitch responses of myofascial trigger points in the lower-back muscles using ultrasonography. Arch Phys Med Rehabil. 2011;92(10):1576–80. e1571*
5. *Alonso-Blanco C, Fernández-de-las-Peñas C, Fernández-Mayoralas DM, de-la- Llave-Rincón AI, Pareja JA, Svensson P. Prevalence and anatomical localization of muscle referred pain from active trigger points in head and neck musculature in adults and children with chronic tension-type headache. Pain Med. 2011;12(10):1453–63.*
6. *Shah JP, Thaker N, Heimur J, Aredo JV, Sikdar S, Gerber L. Myofascial trigger points then and now: a historical and scientific perspective. PM R. 2015;7(7): 746–61.*
7. *Celik D, Mutlu EK. Clinical implication of latent myofascial trigger point. Curr Pain Headache Rep. 2013;17(8):353.*
8. *Castaldo M, Ge HY, Chiarotto A, Villafane JH, Arendt-Nielsen L. Myofascial trigger points in patients with whiplash-associated disorders and mechanical neck pain. Pain Med. 2014;15(5):842–9.*
9. *Quintner JL, Bove GM, Cohen ML. A critical evaluation of the trigger point phenomenon. Rheumatology (Oxford). 2015;54(3):392–9.*

SJIF Impact Factor (2026): 8.863| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 11 | Issue: 3 | March 2026 - Peer Reviewed Journal

10. *Arias-Buria JL, Valero-Alcaide R, Cleland JA, Salom-Moreno J, Ortega- Santiago R, Atin-Arratibel MA, Fernandez-de-las-Penas C. Inclusion of trigger point dry needling in a multimodal physical therapy program for postoperative shoulder pain: a randomized clinical trial. J Manip Physiol Ther. 2015;38(3):179–87.*
11. *Hall ML, Mackie AC, Ribeiro DC. Effects of dry needling trigger point therapy in the shoulder region on patients with upper extremity pain and dysfunction: a systematic review and meta-analysis. Physiotherapy. 2017; in press*
12. *Liu L, Huang QM, Liu QG, Ye G, Bo CZ, Chen MJ, Li P. Effectiveness of dry needling for myofascial trigger points associated with neck and shoulder pain: a systematic review and meta-analysis. Arch Phys Med Rehabil. 2015; 96(5):944–55.*
13. *Shah JP, Danoff JV, Desai MJ, Parikh S, Nakamura LY, Phillips TM, Gerber LH. Biochemicals associated with pain and inflammation are elevated in sites near to and remote from active myofascial trigger points. Arch Phys Med Rehabil. 2008;89(1):16–23.*
14. *Ge HY, Monterde S, Graven-Nielsen T, Arendt-Nielsen L. Latent myofascial trigger points are associated with an increased intramuscular electromyographic activity during synergistic muscle activation. J Pain. 2014; 15(2):181–7.*
15. *Ge HY, Arendt-Nielsen L, Madeleine P. Accelerated muscle fatigability of latent myofascial trigger points in humans. Pain Med. 2012;13(7):957–64.*
16. *Ibarra JM, Ge HY, Wang C, Martinez Vizcaino V, Graven-Nielsen T, Arendt- Nielsen L. Latent myofascial trigger points are associated with an increased antagonistic muscle activity during agonist muscle contraction. J Pain. 2011; 12(12):1282–8.*
17. *Hidalgo-Lozano A, Fernández-de-las-Peñas C, Díaz-Rodríguez L, González- Iglesias J, Palacios-Ceña D, Arroyo-Morales M. Changes in pain and pressure pain sensitivity after manual treatment of active trigger points in patients with unilateral shoulder impingement: a case series. J Bodyw Mov Ther. 2011;15(4):399–404.*
18. *Chiarotto A, Clijsen R, Fernandez-de-Las-Penas C, Barbero M. Prevalence of myofascial trigger points in spinal disorders: a systematic review and meta- analysis. Arch Phys Med Rehabil. 2016;97(2):316–37.*
19. *Downs SH, Black N. The feasibility of creating a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions. J Epidemiol Community Health. 1998; 52(6):377–84.*
20. *Bron C, Dommerholt J, Stegenga B, Wensing M, Oostendorp RA. High prevalence of shoulder girdle muscles with myofascial trigger points in patients with shoulder pain. BMC Musculoskelet Disord. 2011;12:139.*
21. *Fernández-De-Las-Peñas C, Gröbli C, Ortega-Santiago R, Fischer CS, Boesch D, Froidevaux P, Stocker L, Weissmann R, González-Iglesias J. Referred pain from myofascial trigger points in head, neck, shoulder, and arm muscles reproduces pain symptoms in blue-collar (manual) and white-collar (office) workers. Clin J Pain. 2012;28(6):511–8.*
22. *Fernández-Pérez AM, Villaverde-Gutiérrez C, Mora-Sánchez A, Alonso-Blanco C, Sterling M, Fernández-De-Las-Peñas C. Muscle trigger points, pressure pain threshold, and cervical range of motion in patients with high level of disability related to acute whiplash injury. J Orthop Sports Phys Ther. 2012; 42(7):634–41.*
23. *Sari H, Akarirmak U, Uludag M. Active myofascial trigger points might be more frequent in patients with cervical radiculopathy. Eur J Phys Rehabil Med. 2012;48(2):237–44.*
24. *Tali D, Menahem I, Vered E, Kalichman L. Upper cervical mobility, posture and myofascial trigger points in subjects with episodic migraine: case-control study. J Bodyw Mov Ther. 2014;18(4):569–75.*
25. *Higgins J, Green S, editors. Cochrane handbook for systematic reviews of interventions version 5.1.0. [updated march 2011]: The Cochrane Collaboration; 2011.*
26. *Schulz KF, Grimes DA. Case-control studies: research in reverse. Lancet. 2002; 359(9304):431–4.*
27. *Portney LG, Watkins MP. Foundations of clinical research: applications to practice. 3rd ed. Pennsylvania: F.A. Davis Company; 2015.*
28. *Tough EA, White AR, Richards S, Campbell J. Variability of criteria used to diagnose myofascial trigger point pain syndrome - evidence from a review of the literature. Clin J Pain. 2007;23(3):278–86.*
29. *Simons DG, Travell JG, Simons LS. Travell & Simons' myofascial pain and dysfunction. The trigger point manual. Volume 1. Upper half of body., vol. 1. Upper half of body. 2nd ed. Philadelphia: Lippincott Williams and Wilkins; 1998.*
30. *Lucas N, MacAskill P, Irwig L, Moran R, Bogduk N. Reliability of physical examination for diagnosis of myofascial trigger points: a systematic review of the literature. Clin J Pain. 2009;25(1):80–9.*
31. *Al-Shenqiti AM, Oldham JA. Test-retest reliability of myofascial trigger point detection in patients with rotator cuff tendonitis. Clin Rehabil. 2005;19(5):482–7.*
32. *Myburgh C, Larsen AH, Hartvigsen J. A systematic, critical review of manual palpation for identifying myofascial trigger points: evidence and clinical significance. Arch Phys Med Rehabil. 2008;89(6):1169–76.*
33. *Dong W, Goost H, Lin XB, Burger C, Paul C, Wang ZL, Zhang TY, Jiang ZC, Welle K, Kabir K. Treatments for shoulder impingement syndrome a prisma systematic review and network meta-analysis. Medicine. 2015;94(10).*
34. *Koester MC, George MS, Kuhn JE. Shoulder impingement syndrome. Am J Med. 2005;118(5):452–5.*
35. *Khalilov, D.I., Akhmadeeva, L.R., Skarlygin, Z.N., Mavlyanova, Z.F., Kim, O.A. Modern Biological Conduits for Regenerative Surgery of Peripheral Nerves: A Literature Review. Neurology and Neurosurgery Eastern Europe, 2025, 15(1), pp.119-130*
36. *Akhmadeeva, L.R., Galimov, O.V., Baykov, D.E., Mavlyanova, Z.F., Kim, O.A., Mamytova, E.M. Wernicke encephalopathy following bariatric surgery: case report. Avicenna Bulletin, 2024, 26(3), pp.508-518*
37. *Mavlyanova Z., Ravshanov D., Ibragimova M., Irbutaeva L., Khalimova F., May K. Ismail, Shawgi A. Elsiddig, Marwan Ismail, Salma E R Mohamed, Sara Mohammed Ali. Prognostic significance of proliferation (KI-67) and angiogenesis (CD34) markers in meningiomas for the development of rehabilitation strategies. Georgian medical news, 2025, 7-8 (364-365), pp.61-65*