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Effects of Instrument-Assisted Soft Tissue Mobilization in Individuals With Text Neck Syndrome and Neck-Related Musculoskeletal Disorders: A Narrative Review

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Abstract

Text neck syndrome (TNS) is a prevalent condition among individuals of all age groups and both genders, caused by sustained neck flexion due to digital device use for more than three hours per day. Individuals may present with a cluster of symptoms, including neck pain, tingling and numbness in the hands, pain radiating to the shoulder, generalized soreness, and neck muscle spasms. The presence of three or more of these symptoms for more than two weeks may indicate TNS.

This narrative review synthesizes evidence on instrument-assisted soft tissue mobilization (IASTM) as a treatment method for TNS, focusing on its impact on neck pain, range of motion (ROM), and function in individuals with TNS and related musculoskeletal disorders. TNS is increasingly associated with prolonged electronic device use and cervical musculoskeletal symptoms. Although IASTM has been studied in various neck conditions, evidence addressing TNS and related musculoskeletal dysfunctions remains limited and heterogeneous. Therefore, this narrative review aims to critically summarize the available evidence regarding the effects of IASTM on neck pain and cervical range of motion (CROM), identify gaps in current research, and guide future studies and clinical practice.

A comprehensive literature search was conducted for articles published between 2010 and 2025. Relevant articles were identified through databases and search engines, including Google Scholar, PubMed, and PEDro, using Boolean operators combined with the following keywords: ("Instrument-Assisted Soft Tissue Mobilization" OR "IASTM") AND ("Text Neck Syndrome" OR "Mechanical Neck Pain" OR "Chronic Neck Pain") AND ("Range of Motion" OR "Pain" OR "Disability").

This narrative review suggests that IASTM is an effective intervention for reducing neck pain and improving CROM in individuals with TNS and related cervical musculoskeletal dysfunctions. The strongest evidence supports its role in decreasing pain intensity, improving cervical mobility, reducing soft tissue tightness, and enhancing short-term functional outcomes. IASTM appears most effective when incorporated into a comprehensive rehabilitation program, including stretching, strengthening, postural retraining, and ergonomic education.

Categories: Physical Medicine & Rehabilitation
Keywords: cervical range of motion, forward head posture, iastm, instrument-assisted soft tissue mobilization, neck disability index, neck pain, soreness, text neck syndrome

Introduction And Background

Neck pain is one of the major global contributors to disability and has become a significant public health concern in recent years. Its prevalence is similar to that of low back pain across different age groups and genders. Epidemiological data show that about 73% of university students and up to 65% of individuals who work from home experience neck or back pain, with around 40% reporting decreased functionality in day-to-day life. Sustained use of mobile phones, laptops, computers, and TV screens for activities such as texting, emailing, and entertainment has contributed to this increasing prevalence. Current data show that prolonged and unsupervised use of these devices leads to a set of symptoms collectively known as text neck syndrome (TNS), in which sustained neck flexion at an angle of 45° or more can result in fatigue of the upper cervical musculature and related symptoms [1].

TNS can be diagnosed when an individual presents with at least three of the following symptoms for two weeks or more: a history of prolonged use of mobile phones or laptops with the neck in a flexed position for at least three hours daily, sharp neck pain, radiating pain to the shoulder or upper limb, tingling or numbness, muscle spasms, stiffness, generalized soreness, and muscular weakness [2].

Abnormal mechanical loading on the cervical region can lead to the development of small, taut, hypersensitive nodules within the muscle fibers, known as myofascial trigger points (MTrPs), contributing to musculoskeletal imbalance in the upper body. Dysfunction of the upper trapezius (UT) muscle often results in persistent neck pain and may shift mechanical load from the shoulder girdle to cervical structures due to its anatomical attachments. Additionally, neck pain is frequently accompanied by protective muscle spasms that restrict blood flow, thereby exacerbating discomfort. Weakness in both superficial and deep cervical extensor muscles is also commonly associated with such conditions. The primary objectives in managing neck pain and MTrPs include reducing muscle spasms, relieving pain, and deactivating trigger points [3,4].

One therapeutic approach used for this purpose is instrument-assisted soft tissue mobilization (IASTM), which employs specially designed rigid instruments to identify and treat soft tissue dysfunction [3]. Various clinicians have reported its effectiveness in improving patient outcomes [5-10]. IASTM is used to alleviate pain, enhance soft tissue mobility, and improve range of motion (ROM) and functional capacity. The technique works by inducing controlled microtrauma in the affected tissues, thereby promoting the restoration of normal tissue elasticity and function [5].

Despite these reported benefits, existing clinical evidence remains inconsistent, with only a limited number of systematic reviews and meta-analyses available on IASTM. Therefore, there is a need to further update and strengthen the current body of evidence. Accordingly, the present study aims to evaluate the effectiveness of IASTM in reducing neck pain and improving ROM in individuals with TNS and neck-related musculoskeletal disorders.

Review

This narrative review was prepared using the Scale for the Assessment of Narrative Review Articles (SANRA) as a framework for the literature search, study selection, critical appraisal, and synthesis of evidence. A structured search strategy was developed to identify relevant studies evaluating the effects of IASTM on neck pain and cervical ROM in individuals presenting with TNS, chronic mechanical neck pain, forward head posture, or related cervical musculoskeletal dysfunctions (Figure *1*).

Scale for the Assessment of Narrative Review Articles (SANRA) - Scoring Table

SANRA item	Scoring options (selected option highlighted)	Score	Basis for the rating
1) Justification of the article's importance for the readership	0 The importance is not justified. 1 The importance is alluded to, but not explicitly justified. **2 The importance is explicitly justified.**	**2**	Introduction explicitly argues importance: neck pain is a major global cause of disability, text neck is increasing with device use, and evidence on IASTM is inconsistent so an update is needed.
2) Statement of concrete aims or formulation of questions	0 No aims or questions are formulated. 1 Aims are formulated generally but not concretely or in terms of clear questions. **2 One or more concrete aims or questions are formulated.**	**2**	Concrete aim stated in abstract and introduction: effect of IASTM on neck pain and cervical ROM in text neck syndrome and neck-related musculoskeletal disorders.
3) Description of the literature search	0 The search strategy is not presented. 1 The literature search is described briefly. **2 The literature search is described in detail, including search terms and inclusion criteria.**	**2**	Databases, full search strings (Table 1), date range, language, inclusion/exclusion criteria (Table 2) and a flow diagram (Figure 1) are given.
4) Referencing	0 Key statements are not supported by references. 1 The referencing of key statements is inconsistent. **2 Key statements are supported by references.**	**2**	Trial findings are cited, but introduction statistics (73%, 65%, 40%) have no reference; refs 11 and 12 are duplicates (Abdelhamid and Mahmood 2022 missing); several in-text numbers do not match the list (e.g. Menek [8], Unuvar [10]).
5) Scientific reasoning (e.g. incorporation of appropriate evidence, such as RCTs in clinical medicine)	0 The article's point is not based on appropriate arguments. 1 Appropriate evidence is introduced selectively. **2 Appropriate evidence is generally present.**	**2**	Evidence is mainly RCTs / comparative trials, retrieved by a stated search, appraised with RoB-2 and ROBINS-I, and discussed with balanced reasoning; the conclusion is tempered.
6) Appropriate presentation of data (e.g. absolute vs relative risk; effect sizes without confidence intervals)	0 Data are presented inadequately. **1 Data are often not presented in the most appropriate way.** 2 Relevant outcome data are generally presented appropriately.	**1**	Table 3 gives numerical results, but the text relies on "significant" statements, with no effect sizes or confidence intervals, and immediate vs follow-up effects are not separated; some tabulated values contain errors.
Sumscore	Maximum 12	**11**	Items 1, 2, 3 and 5 scored 2; items 4 and 6 scored 1.

FIGURE 1: Self-assessed SANRA score of the current narrative review

SANRA: Scale for the Assessment of Narrative Review Articles; ROBINS: Risk of Bias in Non-randomized Studies; RoB: risk of bias; RCT: randomized controlled trial; IASTM: instrument-assisted soft tissue mobilization; ROM: range of motion

Database/search engine	Search term	Boolean operators	Publication period	Language
PubMed	("Instrument Assisted Soft Tissue Mobilization" OR "IASTM") AND "Text Neck Syndrome" OR "Forward Head Posture" OR "Mechanical Neck Pain" OR "Chronic Neck Pain" AND "Range of Motion" OR "Pain" OR "Disability"	AND, OR	2010-2025	English
Google Scholar	("Instrument Assisted Soft Tissue Mobilization" OR "IASTM") AND "Text Neck Syndrome" OR "Forward Head Posture" OR "Mechanical Neck Pain" OR "Chronic Neck Pain" AND "Range of Motion" OR "Pain" OR "Disability"	AND, OR	2010-2025	English
PEDro	("Instrument Assisted Soft Tissue Mobilization" OR "IASTM") AND "Text Neck Syndrome" OR "Forward Head Posture" OR "Mechanical Neck Pain" OR "Chronic Neck Pain" AND "Range of Motion" OR "Pain" OR "Disability"	AND, OR	2010-2025	English

TABLE 1: Search strategy for the narrative review

Inclusion criteria	Exclusion criteria
Studies investigating IASTM as the primary intervention	Systematic reviews, narrative reviews, editorials, commentaries, and conference abstracts
Studies involving participants with TNS	Studies not involving cervical or neck-related conditions
Studies involving participants with chronic neck pain	Studies not assessing neck pain, disability, posture, or CROM outcomes
Studies involving participants with forward head posture	Studies with insufficient methodological information
Studies involving participants with upper crossed syndrome	Studies without full-text availability
Studies involving participants with cervical myofascial dysfunction	Animal studies
Studies reporting pain outcomes using NPRS or VAS	Non-English publications
Studies reporting CROM outcomes	Studies published before 2010
Studies reporting neck disability, posture and functional outcomes	Case reports and expert opinions
Randomized Controlled Trials	
Comparative Studies	
Experimental Studies	
Quasi-experimental studies	
Full-text studies published in English language	
Studies published between 2010 and 2025	

TABLE 2: Inclusion and exclusion criteria for the narrative review

IASTM: instrument-assisted soft tissue mobilization; NPRS: numerical pain rating scale; VAS: visual analog scale; ROM: range of motion; TNS: text neck syndrome; CROM: cervical range of motion

Author, year	Design and participants	Sample and clinical population	IASTM protocol, duration, and frequency	Comparator/co-intervention	Outcomes and time points	Main findings	Limitations
	Two-group pretest-						

Paranjape and Lad 2020 (Int J Res Rev)	posttest experimental study; chit-method allocation; India; participants aged 18-45 years, both sexes	Planned sample size: n=74 (37 per group), based on a pilot study; chronic neck pain >3 months with levator scapulae tenderness	M2T blade (Plane 2) applied to the levator scapulae in a seated position using 45° strokes; single session; duration not reported	Manual soft tissue mobilization using the ulnar border/heel of the hand in the prone position; intensity adjusted according to patient tolerance in both groups	Goniometer flexion and contralateral side-flexion, NPRS rest/activity, NDI (%). Pre-intervention and 48 hours post-intervention	Significant improvements in cervical contralateral side-flexion (22.4° to 24.1°), activity-related pain (NPRS: 6.0 to 4.3) and neck disability (NDI: 27.0 to 19.2) were observed following a single session of IASTM (p=0.05)	No long-term follow-up; limited generalisability. Single session; no control; analysed n and dropouts not reported; ROM gains (≈2°) are small; blinding not described
Mahmood et al. 2021 (JPMA)	RCT (coin toss), 2 centers in Bahawalpur, Pakistan; non-probability purposive sampling	n=60 (30/30); males only, 18-40 y; UCS with neck pain ≥3 months, NPRS >3	Gua Sha tools (GST4/5) + gel on pectoralis major, UT, levator, sub-occipitals, latissimus dorsi (30° bevel up); 15-20 minutes/session; 3 sessions/week for 4 weeks	RPT alone (hot pack + stretching/postural exercises) vs. IASTM + RPT	NPRS and inclinometer ROM (flexion, extension, and bilateral bending). Assessments conducted at baseline, 2 weeks, and 4 weeks	At the four-week assessment, NPRS scores decreased to 1.57 ± 0.56 in the IASTM group compared with 2.06 ± 0.94 in the RPT group, with a significantly greater mean reduction in the IASTM group (4.13 vs. 3.50; p=0.01). Cervical flexion improved by 23.6° in the IASTM group compared with 20.5° in the RPT group (p=0.03)	Males only; two centers in one city. Table 2 gives R-bend in 23.4° to 46.1°, but Table 3 gives a difference of 38.2°; The claim of a significant baseline pain difference is inconsistent; blinding was not described
Mylonas et al. 2021 (BMC MSK Disord)	RCT, Greece; women 43-65 years; retrospectively registered (ISRCTN)	n=20 (10/10). Mechanical neck pain >3 months with forward head posture (CVA <50°)	ERGON IASTM on cervical, thoracic and shoulder-girdle areas, 10 min (after 10 min warm-up massage); 8 sessions (2×/week × 4 weeks) + neuromuscular exercises	Classical massage (20 minutes total) + same exercises	Craniovertebral angle (photogrammetry), inclinometer ROM, MicroFET2 strength, VAS, NDI. Each session; NDI also at 2 and 4 weeks post	VAS scores decreasing by 5.97 points compared with 3.1 points in the massage group at the short-term assessment and by 5.5 vs. 1.5 points at the intermediate-term assessment. Neck disability improved considerably in the IASTM group, with NDI scores decreasing from 31.4 to 11.8 immediately after treatment and further to 6.2 at the 4-week follow-up, compared with 29 to 22 and 23.2, respectively, in the massage group	Convenience sample; heterogeneous pathology; varied prior exercise. Small n; women only; both arms got massage, so the IASTM-specific contrast is up to 10 minutes; baseline VAS differed (6.1 vs 4.0); retrospective registration
Shewail et al. 2023 (BMC MSK Disord)	Quasi-experimental pre-post (randomly assigned, unblinded); Egypt; college students 18-25 years	53 randomized, 33 analyzed (IASTM 18, MRT 15); mean age 21.3; mostly female. Chronic mechanical neck pain >3 months, VAS ≥30 mm, UT/levator trigger point	M2T blade, UT bilaterally, sweeping from origin to insertion for up to 3 min; 2×/week × 4 weeks (8 sessions)	Myofascial release (supine UT stretch, 30 seconds holds). Both groups + postural/strengthening exercises	VAS (right/left), NDI, and PPT (algometer). Pre-intervention and 4 weeks post-intervention	Post-intervention VAS scores were 3.17 in the IASTM group compared with 3.40 in the MRT group (p=0.60). NDI scores were 31.3 in the IASTM group and 33.2 in the MRT group (mean difference: 1.88; p=0.50).	Small sample, large dropout, short intervention, no follow-up, 2 muscles only, no control group. Sample size planned n=52, analyzed 33 (38% attrition); post-only t-tests
Hamdy et al. 2023 (J Chiropr Med)	Single-blind RCT, 3 arms, Egypt; ages 18-30, BMI 18-25	n=90 (30/30/30); 86 completed, INIT with multiple imputation; up to 90% female. Non-specific chronic neck pain with active UT trigger points	M2T blade on UT, 45°, long slow strokes insertion toward origin, 2-3 minutes; 3×/week × 4 weeks + STT	INIT (ischemic compression + strain-counter-strain + MET) + STT; STT alone (hot pack, isometrics, stretching, and AROM)	VAS, PPT, Arabic NDI, and UT EMG (RMS%, median frequency). Assessments conducted at baseline and 4 weeks	VAS scores decreased from 6.8 to 3.2 in the IASTM group compared with 7.1 to 5.3 in the STT group	ROM not measured; no long-term follow-up; proprioception and endurance not measured. Young, predominantly female sample; therapist not blinded
Agarwal et al. 2024 (Hong Kong Physiother J)	Single-blind (assessor) RCT; India; 18-50 years	Planned n=32 (abstract says 31); 28 analyzed (14/14); 88% female. Myofascial pain syndrome of UT (≥1 trigger point, NPRS-activity 4-8)	Edge mobility tool: scan (60°) then short strokes with blunt edge parallel to fibers, 4-5 minutes; 3 sessions over 1 week	Manual MFR (focused stretch + ischaemic compression 60-90 seconds). Both: hot pack, ROM, chin tucks, scapular sets, and ice application	NPRS (max on activity; at evaluation), PPT, inclinometer flexion/side-flexion, NDI. Assessments conducted at baseline and after last session	The mean reduction in NPRS scores during activity was greater in the IASTM group than in the MFR group (3.70 ± 1.32 vs. 2.42 ± 1.15; p=0.011).	No follow-up/retention; small sample; subjective NPRS; interaction with co-treatments. Only 1 week; MFR arm mixes stretch + ischaemic compression; participants not blinded; n=31 vs 32 discrepancy
Unuvar et al. 2024 (J Chiropr Med)	Single-blind (assessor) RCT; Türkiye; 21-44 years	n=40 (20/20, no dropouts); 22F/18M. CNP ≥3 months, VAS ≥3, bilateral cervical muscle spasm	Trapezius + sternocleidomastoid bilaterally, 90 s/muscle, 60 pulses/min, 30°-60° strokes, Vaseline; single session	Kinesio tape (inhibition technique, 15%-25% tension)	VAS during activity; joint position error (continuous ROM device, 6 directions). Assessments at pre and 2 min post	VAS scores decreased from 6.02 to 3.53 in the IASTM group (mean reduction: 2.49) and from 5.72 to 3.82 in the Kinesio taping group (mean reduction: 1.90)	Immediate effects only; no control; no long-term follow-up; not pragmatic; cause of neck pain not analyzed. Authors judge pain change below minimal clinically important difference (2-2.7 cm), yet change in IASTM 2.49 falls within that range
			Arco tool on neck				small n; no standardized patient-

Bostan and Kaya 2024 (J Man Manip Ther)	Single-blind (participants) RCT; Türkiye; 18-70 years	n=48 (24/24); mean age 44.3; 67% female. Non-specific CNP ≥3 months	extensors, UT, levator, splenius; 3 minutes/side (1 min sweeping 45° + 2 min fan 30°); 2×/week × 4 weeks (8 sessions), before exercise	Exercise therapy alone (35 min, 3×/week × 4 weeks: chin tuck, stretching, isometrics, YWT pose) vs. IASTM + same protocol	VAS; deep neck flexor endurance. Baseline and 4 week assessments.	VAS scores decreased from 9.04 to 2.63 in the IASTM group (mean reduction: 6.41 points), compared with a reduction from 8.67 to 4.29 in the Exercise therapy group (mean reduction: 4.37 points)	reported measures; deep neck flexor endurance has wide SEM/MDC (gain not clinically meaningful); outcome assessor not blinded; no follow-up. IASTM arm had extra contact time; primary investigator delivered all steps
Saleh et al. 2025 (Egypt J Hosp Med)	Single-blind (patients only) RCT, 3 arms; Egypt; 18-35 years, normal BMI	60 randomized, 56 analyzed (IASTM 19, MET 19, control 18); mixed sex. Chronic non-specific neck pain >3 months	M2T blade on sternocleidomastoid bilaterally, supine, ~3 min sweeping origin towards insertion; 2×/week × 4 weeks + control protocol	Control: hot pack + ROM/stretch/strengthening. MET group: post-isometric relaxation of sternocleidomastoid + control protocol	VAS, NDI (/50), CROM device (6 movements). Pre-intervention and 4 weeks post-intervention	Post-intervention VAS scores were 1.37 in the IASTM group and 1.74 in the MET group, compared with 3.33 in the control group. NDI scores were lower in the IASTM and MET groups (10.74 and 11.37, respectively) than in the control group (20.78). Cervical extension was greater in the IASTM group (68.3°) than in the MET group (63.5°) and the control group (54.1°), with a significant difference favoring the IASTM group	No limitations section reported. Note: abstract says IASTM beat MET on rotation, lateral flexion, pain, and disability, but the post-hoc table shows only extension differing; MET dose (3×/week) differs from other arms (2×/week); only post values seen in tables; per-protocol; no follow-up
Siddiqui et al. 2025 (Insights-JHR)	RCT (coin toss); Rawalpindi, Pakistan; 20-50 years	n=30 (15/15); 93% female. UCS with forward head posture (tragus-to-wall >9.5 cm)	Graston tool on UT at 45°, origin toward insertion, 120 s; 3×/week × 4 weeks; plus hot pack, stretches, cold pack	Myofascial (percussion) gun on UT, 5 min, 2100 to 3600 rotations per minute progressive; same co-interventions	NPRS, inclinometer ROM, tragus-to-wall distance, NDI. Baseline and 4-week follow-up	NPRS scores decreased from a median of 6 to 2 in the IASTM group and from 7 to 2 in the percussion massage group. Cervical flexion improved from 47.0° to 66.1° following IASTM and from 51.1° to 63.7° following percussion massage. NDI scores decreased from 70.4 to 19.5 in the IASTM group and from 67.5 to 19.7 in the percussion massage group	No limitations section. Small n; no control; no follow-up; table errors (gun-group post NDI=pre-NDI 67.54; right lateral flexion unchanged yet p<0.001; Table 4 pre/post labels swapped; IASTM left lateral flexion missing)
Jahan 2025 (Indian J Community Med)	Comparative study, lottery randomization; Aurangabad, India; 20-45 years	n=30 (15/15); 28F/2M. Neck pain >2 weeks, VAS ≥5	M2T blade on UT, 45°, 3 min; 2×/week × 4 weeks + passive UT stretch + home stretching	Dry (silicone) cupping + stretching	VAS; goniometer cervical flexion and lateral flexion. Baseline and 4-week follow-up	In the IASTM group, VAS scores decreased from 7.25 to 5.65 (p=0.031), whereas the cupping group showed a greater reduction from 7.25 to 3.65 (p=0.001)	small sample; subjective pain; need larger/longer studies. Low reliability: ROM values (≈150°-177°) and standard deviations (up to 93°) are implausible for cervical flexion; no between-group test described; cupping dose not reported; blinding unclear
Menek et al. 2025 (J OrthopSurg Res)	RCT, 3 arms; Istanbul; 30-60 years; prospectively registered	60 randomized, 57 analyzed (19/19/19). MRI-confirmed cervical disc herniation (mild-moderate, no radiculopathy), pain ≥3 weeks, VAS ≥4	Stainless-steel tools on trapezius, splenius, sub-occipitals (C1-T1), sweep/fan 30°-60°, 9 minute/session; 3×/week × 3 weeks + CT	CT alone (hot pack, TENS, AROM, and isometrics) vs. CT + percussion massage (Hypervolt 33-40 Hz, 3 minute/muscle group) vs. CT + IASTM	VAS rest/activity, NDI, Tampa Scale of Kinesiophobia, and joint position sense (laser test). Baseline and 3-week follow-up	The mean reduction in resting VAS scores was 4.00 points in the IASTM group, 3.38 points in the PMT group, and 2.13 points in the CT group	3-week duration only; no sham/no-treatment control; Joint Position Sense not computerised; no stratification by disc level or severity. Baseline imbalance in age/NDI/TSK (ANCOVA-adjusted); per-protocol analysis; adjunct arms had extra treatment time

TABLE 3: Study characteristics of the included studies for the narrative review

n: no. of participants; M: male participants; F: female participants; RCT: randomized controlled trial; UT: upper trapezius; IASTM: instrument-assisted soft tissue mobilization; TPR: trigger point release; PPT: pain pressure threshold; VAS: visual analog scale; NPRS: numerical pain rating scale; NDI: neck disability index; ROM: range of motion; UCS: upper crossed syndrome; RPT: routine physical therapy; CVA: cranio-vertebral angle; MRT: myofascial release therapy; BMI: body mass index; INIT: integrated neuromuscular inhibition techniques; STT: supervised traditional therapy; MET: muscle energy technique; EMG: electromyography; RMS: repetitive muscle strain; MFR: myofascial release; CNP: chronic neck pain; SEM: standard error of measurement; MDC: minimal detectable error; C1: cervical vertebra 1; T1: thoracic vertebra 1; CT: conventional therapy; TSK: Tampa Scale for Kinesio-phobia; M2T: myofascial mobilization technique; ISRCTN: International Standard Randomized Controlled Trial Number; AROM: active range of motion; TENS: transcutaneous electrical nerve stimulation; ANCOVA: analysis of covariance

Study	D1	D2	D3	D4	D5	Overall	Key rationale
Paranjape and Lad 2020	Some concerns	Some concerns	Some concerns	High risk	Some concerns	High risk	Chit method with no concealment described. No blinding described. Planned n=74 but analyzed n/dropouts not reported. Self-reported pain/NDI with no assessor blinding stated. No registration or protocol
Mahmood et al., 2021	High risk	Some concerns	Low risk	Some concerns	Some concerns	High risk	Coin toss is unconcealed and easy to subvert; purposive sampling. No participant/therapist blinding. All 60 analyzed. Independent assessor but self-reported NPRS. Internal inconsistencies in tables/p-values

Mylonas et al., 2021	Some concerns	Some concerns	Low risk	Some concerns	Some concerns	Some concerns	Online randomizer run by a third party. Baseline VAS differed (6.1 vs. 4.0) with n=10/arm. Participants unblinded. No dropouts. Blinded assessors, but self-reported VAS/NDI. Retrospective registration; many time points
Hamdy et al., 2023	Low risk	Some concerns	Low risk	Some concerns	Low risk	Some concerns	Computer block randomization, sealed opaque envelopes, allocator not involved in treatment. Single-blind; one therapist delivered all arms. 4/90 lost, INIT with multiple imputation. Blinded assessor, but VAS/NDI self-reported. Prospectively registered
Agarwal et al., 2024	Some concerns	Some concerns	Some concerns	Some concerns	Some concerns	Some concerns	Computer-generated sequence, concealment not described. Participants aware of allocation. 4/32 dropped, completer analysis. Blinded assessor, self-reported NPRS. No registration reported; n=31 vs. 32 discrepancy
Unuvar et al., 2024	Some concerns	Some concerns	Low risk	Some concerns	Low risk	Some concerns	Block randomization by an independent researcher, concealment not stated. Single session, no dropouts. Assessor blinded in another room; VAS self-reported by unblinded participants. Prospectively registered
Bostan and Kaya, 2024	Some concerns	Some concerns	Low risk	High risk	Some concerns	High risk	Simple randomization, concealment not described. Only participants blinded; IASTM arm had extra contact time. All 48 analyzed. Outcome assessor not blinded (primary investigator collected all data and delivered treatment). NCT number suggests registration after the study period; verify
Saleh et al., 2025	Some concerns	Some concerns	Low risk	High risk	Some concerns	High risk	Computer block randomization, concealment not described. Single-blind (patients only); MET dose (3×/week) differs from other arms. 4/60 dropouts, per-protocol. Assessor not blinded for CROM/VAS/NDI. Registration (NCT06799130) near the start of the study period; abstract claims exceed the post-hoc table
Siddiqui et al., 2025	High risk	Some concerns	Low risk	High risk	Some concerns	High risk	Coin toss. No blinding described. No dropouts reported. Assessor blinding not stated, subjective NPRS/NDI. Registered, but several table errors (e.g., NDI post=pre in the gun group)
Jahan, 2025	Some concerns	Some concerns	Low risk	High risk	High risk	High risk	Lottery allocation, concealment unclear. No blinding described. 15/15 analyzed. Assessor blinding not described; implausible ROM values (150°-177°). No registration; between-group tests not described, and results shown mainly as graphs
Menek et al., 2025	Some concerns	Some concerns	Low risk	Some concerns	Low risk	Some concerns	randomizer.org list with sealed opaque envelopes, but baseline imbalance in age (45.9 vs. 37.1 years), NDI, and TSK. Participant blinding not feasible; per-protocol, 3/60 lost. Blinded assessor, self-reported VAS/NDI. Prospectively registered

TABLE 4: RoB using RoB-2 critical appraisal tool

NDI: neck disability index; ROM: range of motion; PPT: pain pressure threshold; VAS: visual analog scale; NPRS: numerical pain rating scale; INIT: integrated neuromuscular inhibition techniques; MET: muscle energy techniques; TSK: Tampa Scale for Kinesio-Phobia; IRCT: Iranian Registry of Clinical Trials; RoB: risk of bias; IASTM: instrument-assisted soft tissue mobilization; NCT: Number for ClinicalTrials.gov; CROM: cervical range of motion

Data sources and search strategy

A comprehensive literature search (shown in Table *1*) was conducted using the PubMed, Google Scholar, and PEDro databases. Keywords were combined using Boolean operators: ("Instrument Assisted Soft Tissue Mobilization" OR "IASTM") AND ("Text Neck Syndrome" OR "Forward Head Posture" OR "Mechanical Neck

Pain" OR "Chronic Neck Pain") AND ("Range of Motion" OR "Pain" OR "Disability").

The search focused on articles published between 2010 and 2025 to ensure relevance. We included only full-text studies published in English and involving human participants (Figure 2).

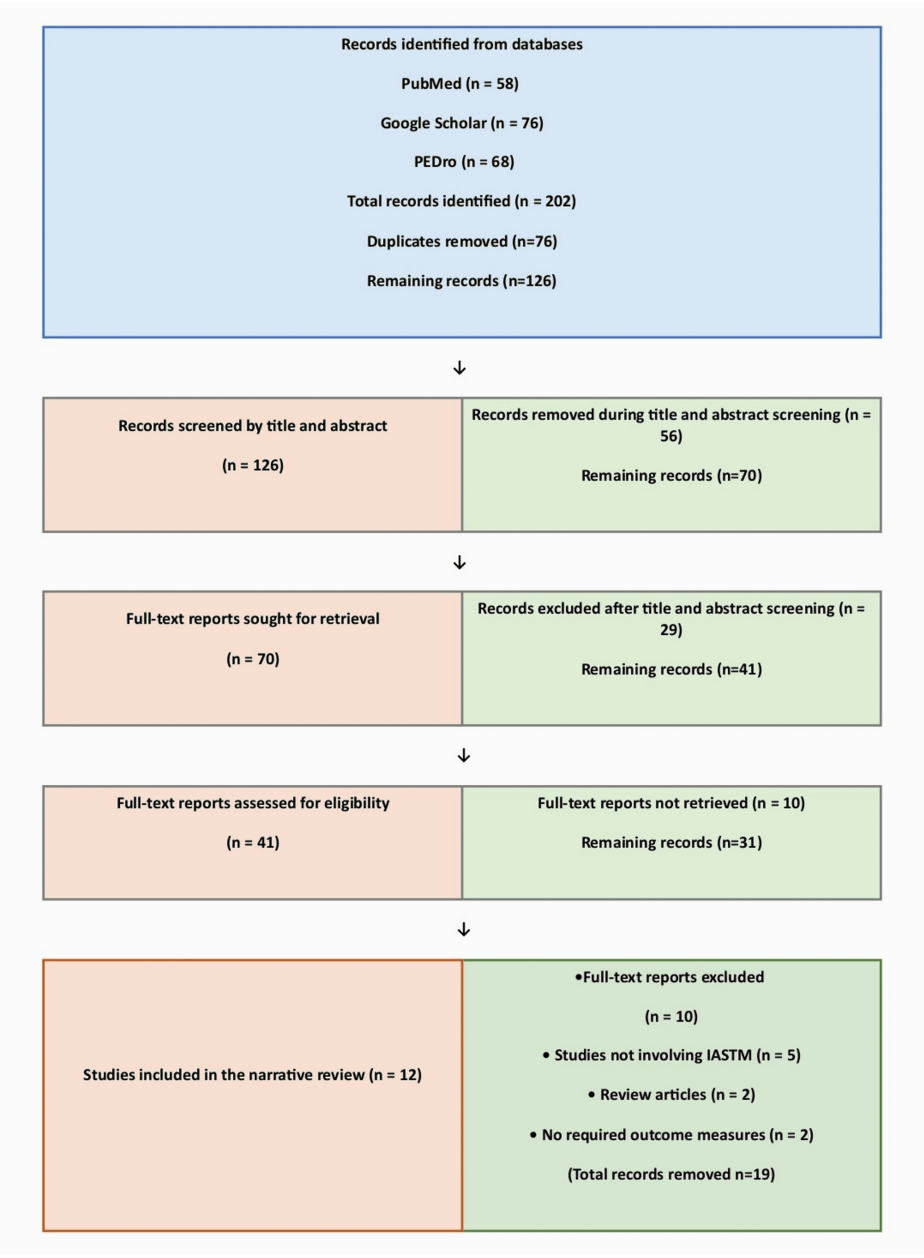

FIGURE 2: Flow diagram for study selection of the narrative review

n: number of studies; IASTM: instrument-assisted soft tissue mobilization

Effects of instrument-assisted soft tissue mobilization on neck pain

Pain reduction was the most consistently reported outcome across the included studies. Several randomized controlled trials and comparative studies demonstrated significant improvements in neck pain following the application of IASTM to the UT, levator scapulae, cervical paraspinal muscles, and suboccipital muscles. Mahmood et al. conducted a study in which they recruited 60 patients with Upper Crossed Syndrome and divided them into two groups, comparing protocols with and without IASTM. The IASTM group showed superior outcomes in pain improvement over eight weeks [3]. Similarly, studies by Mylonas et al. [6] (n=20), Saleh et al. [9] (n=56), Menek et al. [10] (n=57), and Siddiqui et al. [11] (n=30) compared IASTM with massage, muscle energy techniques, and percussion massage therapy, respectively, and showed significant improvements in pain in the between-group analyses compared with their respective comparators.

In contrast, studies by Paranjape et al. [4] (n=74), Hamdy et al. [5] (n=90), Shewail et al. [7] (n=33), Unuvar et al. [8] (n=40), Agarwal et al. [12] (n=31), and Jahan [13] (n=30) compared IASTM with integrated neuromuscular inhibition techniques (INIT) and supervised traditional therapy, myofascial release technique, Kinesio taping, trigger point release technique, manual myofascial release, and dry cupping, respectively. These studies reported statistically significant improvements in pain in both groups; however, the between-group analyses did not reveal statistically significant differences (Table 5).

Study	D1	D2	D3	D4	D5	D6	D7	Overall	Key rationale
Shewail et al. 2023	Some concerns	High risk	Low risk	Some concerns	High risk	High risk	Some concerns	High risk	Baseline demographics were comparable, but baseline outcome measures were not reported, and no adjustment was made. Of 53 randomized participants, 33 were analyzed (5/4 withdrew before starting; 3/8 were lost to follow-up, indicating differential attrition). Interventions were clearly defined. Participants and investigators were unblinded; adherence was not reported. Outcomes were self-reported (VAS/NDI). The trial was registered on 28/01/2022 (timing relative to study commencement unclear); statistical analysis used post-intervention t-tests only

TABLE 5: RoB using ROBINS-1 critical appraisal tool

VAS: visual analog scale; NDI: neck disability index; RoB: risk of bias

Bostan et al. [14] (n=45) compared IASTM with a myofascial gun and exercise therapy alone. The study also demonstrated significant improvements in pain in the between-group analysis, with greater benefits observed in the IASTM group compared with the comparators.

Although several studies demonstrated statistically significant improvements in pain following IASTM, comparable improvements were also observed with alternative interventions [4,5,7]. This may be attributed to the overlapping therapeutic mechanisms of these techniques, which include mechanical stimulation of soft tissues, modulation of nociceptive transmission, improved local circulation, and reduction in myofascial sensitivity [3-5]. For instance, INIT and myofascial release techniques may address trigger-point-related dysfunction through sustained compression and tissue relaxation, whereas Kinesio taping and percussion massage provide sensory stimulation that may influence pain perception [5,7,8,10]. The addition of conventional exercises, stretching, and postural correction in both intervention groups may have contributed to improvements independent of the specific soft-tissue technique [6,7,10,11]. Furthermore, limitations such as small sample sizes, short intervention periods, and the absence of control groups in some studies may have influenced the ability to identify statistically significant differences between interventions [7,13].

Effects of instrument-assisted soft tissue mobilization on cervical range of motion

Improvement in cervical ROM was a consistently reported outcome across these studies. The greatest gains were commonly observed in cervical flexion, extension, rotation, and lateral flexion. These improvements were associated with decreased soft tissue restriction in the posterior cervical musculature and shoulder girdle. Paranjape et al. reported statistically significant improvements throughout the treatment period but observed greater improvement in the comparator group (manual soft tissue intervention (STM)) than in the IASTM group [4]. Similarly, studies by Jahan found greater improvements in cervical ROM in the comparator group, which received dry cupping, than in the IASTM group [12].

Studies by Mylonas et al. [6] reported statistically significant improvements in both groups; however, comparisons between IASTM and neuromuscular exercises alone showed no statistically significant differences in cervical ROM. Studies by Menek et al. [10] demonstrated improvements in cervical ROM in both the conventional therapy with IASTM group and the conventional therapy with percussion massage group. However, the between-group analysis did not reveal statistically significant differences. Studies by Unuvar et al. [8], Siddiqui et al. [11], Jahan [13], and Agarwal et al. [12] demonstrated statistically significant improvements in cervical ROM throughout the treatment period but reported no statistically significant between-group differences when IASTM was compared with Kinesio taping, myofascial gun, trigger point release techniques, and myofascial release, respectively. Studies by Saleh et al. compared IASTM with muscle energy techniques and found a statistically significant difference in cervical ROM improvement, favoring the IASTM group [9].

The absence of statistically significant differences in cervical ROM between IASTM and other interventions may be attributed to the overlapping effects of soft tissue mobilization techniques on tissue stiffness, muscular tension, and movement restriction [4,5,7,11,12]. Both manual STM and IASTM may improve tissue mobility through mechanical stimulation and changes in soft tissue extensibility [3,4]. Common co-interventions, such as moist heat, stretching, strengthening, and neuromuscular exercises, may independently contribute to improvements in cervical mobility [6,7,10,11]. In studies targeting specific muscles, the extent of improvement may also depend on whether the treated muscle is the primary contributor to the restricted movement [4,9]. For example, Paranjape and Lad suggested that untreated cervical extensor muscles could have contributed to persistent limitations in cervical flexion [4]. Nevertheless, Saleh et al. demonstrated greater improvements with IASTM compared with MET, potentially reflecting the benefits of direct mechanical mobilization of the sternocleidomastoid muscle [9].

Effects on neck disability and function

Several studies also reported improvements in functional disability, commonly measured using the neck disability index (NDI). Reduced pain, combined with improved ROM, was associated with better daily functioning, postural tolerance, prolonged sitting tolerance, and endurance during smartphone or computer use. Patients reported reduced stiffness and movement restriction, improved work performance, and greater neck comfort during prolonged device use. Functional improvement was more pronounced when IASTM was combined with postural correction exercises, stretching, strengthening, and ergonomic education. Studies by Mahmood et al. [3], Paranjape et al. [4], Mylonas et al. [6], Saleh et al. [9], and Menek et al. [10], which compared IASTM with routine physical therapy, manual STM, massage, muscle energy techniques, and conventional therapy, respectively, reported statistically significant between-group differences favoring the IASTM group.

Studies by Hamdy et al. [5], Shewail et al. [7], Siddiqui et al. [11], and Agarwal et al. [12], which compared IASTM with INIT, myofascial release therapy, myofascial gun therapy, and manual myofascial release, respectively, showed significant improvements over time. However, the between-group analyses did not demonstrate statistically significant differences between IASTM and the comparator groups in terms of neck disability and function.

Although improvements in neck disability were observed following IASTM, comparable improvements were also reported with alternative STMs [5,7,11,12]. This may be explained by the relationship between pain reduction, improved cervical mobility, and functional recovery [3,4,6,9]. Since interventions such as INIT, myofascial release, and myofascial gun therapy also address muscular tightness and myofascial dysfunction, they may produce comparable improvements in activities of daily living [5,7,11]. The addition of conventional exercises and other physiotherapy interventions may contribute to functional improvements in both groups [7,10,11]. The relatively short treatment duration, small sample sizes, and absence of control groups in certain studies may also have limited the ability to establish the superiority of IASTM over comparator interventions [7,12].

Comparison of instrument-assisted soft tissue mobilization with other interventions

The included literature compared IASTM with conventional physiotherapy, stretching, myofascial release, INIT, manual soft tissue mobilization, and exercise therapy. Overall, the findings indicate that IASTM combined with exercise generally showed superior outcomes in terms of pain reduction and ROM improvement compared with exercise alone. When compared with manual soft tissue mobilization, IASTM showed slightly greater short-term improvements in ROM. When compared with INIT, both interventions were effective, with no clear superiority in symptom management [3-14].

The comparative effectiveness of IASTM depended on the type of intervention used as a comparator and the underlying clinical impairments being addressed. When combined with conventional physiotherapy, IASTM demonstrated additional benefits over exercise-based treatment alone, potentially due to its ability to address localized myofascial restrictions and tissue stiffness [3,14]. However, when compared with other manual and STMs, including manual STM, myofascial release, and INIT, the findings frequently demonstrated comparable improvements [4,5,7,12]. This may be attributed to overlapping therapeutic mechanisms involving mechanical stimulation, reduction in tissue tension, modulation of pain sensitivity, and improvement in muscle extensibility [3-5,7]. Interventions such as Kinesio taping and percussion massage may produce comparable outcomes through sensory stimulation and modulation of pain perception [8,10]. Therefore, the available evidence suggests that IASTM is a potentially effective adjunct to conventional physiotherapy, although its superiority over other active STMs is not consistently established [3-14].

Conclusions

The findings of the included studies suggest that IASTM is an effective intervention for improving neck pain, CROM, and functional disability in individuals with neck-related musculoskeletal conditions. Most studies reported significant within-group improvements in pain, cervical mobility, and neck-related

disability following IASTM, particularly when combined with conventional physiotherapy, stretching, strengthening, and postural correction exercises. However, evidence regarding its superiority over other interventions remains inconsistent. Although some studies demonstrated significantly better outcomes with IASTM compared with exercise therapy, massage, and other conventional approaches, several comparative studies found no statistically significant between-group differences when IASTM was compared with manual soft tissue mobilization, myofascial release, integrated neuromuscular inhibition techniques, and other manual therapies. Improvements in CROM and functional outcomes also varied across studies. Overall, IASTM appears to be a promising adjunct to conventional physiotherapy for managing neck pain; however, current evidence does not establish its consistent superiority over other treatment approaches. Further high-quality randomized controlled trials with larger sample sizes, standardized treatment protocols, and longer follow-up periods are required to establish its comparative effectiveness and long-term benefits.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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