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Exploring the Effects of Instrument-Assisted Soft Tissue Mobilization on Pain and Function in Patients with Non-Specific Low Back Pain

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ABSTRACT

Background: Low back pain (LBP) is the most prevalent musculoskeletal disorder worldwide, with non-specific LBP frequently affecting individuals in occupations requiring prolonged sitting or standing. Sustained static postures impose considerable biomechanical stress on the lumbar spine, leading to muscular fatigue and the development of myofascial trigger points (MTrPs), particularly within the quadratus lumborum and hamstrings. These hyperirritable nodules potentiate nociceptive signalling and contribute to functional limitations. This study aimed to evaluate the efficacy of Instrument-Assisted Soft Tissue Mobilization (IASTM) in reducing MTrP sensitivity and enhancing functional outcomes in individuals with non-specific LBP.
Methods: A single-blinded, parallel-arm randomized controlled trial was conducted involving 30 participants aged 18 to 40 years, all with chronic non-specific LBP of at least two years and occupational exposure to prolonged sitting or standing. Primary outcomes included pain pressure threshold (PPT) measured via pressure algometry, hamstring flexibility assessed by active knee extension (AKE), and spinal lateral flexion evaluated with the modified Schober test.
Results: Post-intervention analysis revealed statistically significant improvements in all parameters ($p < 0.05$), with increased PPT, enhanced hamstring extensibility, and greater spinal lateral flexion.
Conclusion: IASTM demonstrated significant efficacy in alleviating pain sensitivity and improving musculoskeletal function, underscoring its potential as an adjunct to conventional rehabilitation in non-specific LBP management.

Keywords: Active myofascial trigger points, Quadratus lumborum, IASTM, Non-specific LBP, Pain Pressure Threshold

INTRODUCTION

The most common self-reported musculoskeletal pain is low back pain (LBP). It frequently occurs and has significant socioeconomic repercussions. 42.4% was reported to be the estimated prevalence of LBP in India in 2016. The majority of those with low back pain (60.9%) were moderately disabled [(1)]. Facet syndrome is a typical factor in lower back discomfort. Facet syndrome is an abnormality of the vertebrae's posterior joints, where there is an overriding of the facets and neighboring vertebrae. As a result, over time, the muscles become hypertonic and the ligaments shorten, pulling the contiguous portions of the neighboring vertebrae together (2).

Pain between the costal margins and the inferior gluteal folds is known as nonspecific LBP. without a clear anatomical or neurophysiological reason, followed by a painful limitation of mobility that may be linked to referred pain, and that may have a mechanical, musculoskeletal, or multifactorial cause (3). Pain is mechanical in origin, which means it changes and depends on physical activity and poor postures over extended periods of time (4)

The QL muscle originates from multiple regions, including the iliac crest, the transverse processes of the lumbar vertebrae, and the 12th rib, and consequently connected directly or indirectly to a variety of multifactorial functions, including when working in conjunction with the diaphragm, QL serves as an auxiliary muscle of respiration. The quadratus lumborum also aids in spinal extension and lateral flexion, depresses the final rib, and permits lung expansion and it also serves as a vital stabilizer of the lumbar spine (5). As a result of the muscle's attachments to the spine and pelvis, it is frequently used in activities that prolong standing and sitting, which can decrease blood flow to the region, particularly in the QL and surrounding areas. Additionally, weak back muscles and repetitive actions can cause pain, poor posture and increased muscle tension limit muscle flexibility, causing the Quadratus lumborum to overcompensate in order to stabilize the spine with the pelvis. The contralateral quadratus lumborum muscle will eccentrically contract to control lateral flexion when the body is upright.

The thoracolumbar fascia, a connective tissue covering the rear region of the human body, includes the quadratus lumborum. These myofascial bands are tensile and form a single continuous structure that could potentially put stress on any fascia-enclosed structures. Fascial dysfunctions can happen when the body's ability for the fascia to glide and slide, distribute and transmit fascial tension, and generate compensatory movement patterns decreases. This results in symptoms like pain from the formation of myofascial trigger points, stiffness, tissue fatigue, and decreased function (6).

The hamstrings are situated in the posterior compartment of the thigh from the hip to the knee and from the medial to the lateral aspect. These muscles all originate from the hip and knee joints and execute hip extension and knee flexion. Reduced hamstring muscular flexibility affects the lumbar pelvic rhythm and the spine's sagittal curvature, which causes compensatory motions and contributes to non-specific low back pain. Increased spinal stress and decreased spinal stability are hallmarks of LBP. The pelvis may tilt backward as a result of tight hamstring muscles limiting lumbar lordosis and perhaps decreasing the ability to absorb stress. The quadratus lumborum must continually contract to push the pelvis anteriorly as a result of the lumbar spine being dragged flat, which forces it to compensate in order to maintain the lordotic curvature. Due to overcompensation, if this goes on for an extended length of time, it will create chronic low back pain by causing deep, throbbing pain with trigger points and muscle stiffness (7).

Only four ideas are thought to be the most significant when it comes to the normality and abnormality of Muscle trigger point. They result from extremely quick repetitive movements, asymmetrical postures, and prolonged stress situations, which produce microtrauma and the breakdown of the sarcoplasmic reticulum (8) As blood flow is impaired and Ca2+ is improperly gathered, this sustained maximum effort of muscle at 30% to 50% contraction causes ischemia and the accumulation of metabolic waste. This insufficient Ca2+ results in a lack of ATP and an energy crisis. The release of nociceptive pain-causing chemicals is caused by severe local hypoxia combined with the energy crisis. In order to resist localized discomfort, hardened muscle forms myofascial trigger points, which are tender places. As a result, muscle develops a defense mechanism that results in decreased flexibility leaving the structures easily exposed to other injuries [9].

Soft tissue therapy, including IASTM, enhance musculoskeletal function by mobilizing both superficial and deep tissues. Based on Cyriax's theory, IASTM targets myofascial dysfunction through specialized stainless-steel tools, promoting blood flow, lymphatic circulation, and cellular activity. The technique is believed to stimulate fibroblast recruitment, facilitating the resorption of fibrosis and the breakdown of adhesions and scar tissue, leading to improved tissue mobility and regeneration [10]. This study is needed to address the limited clinical evidence on the effectiveness of IASTM in manipulating myofascial dysfunction, fibrosis, and adhesions. By exploring how IASTM improves blood flow, lymphatic circulation, and tissue regeneration, the study aims to provide evidence-based insights into its potential as an effective treatment for musculoskeletal disorders.

MATERIALS & METHODS

This single-blinded randomized controlled trial was conducted in 2022 at the Outpatient Department of a physiotherapy institution affiliated with a deemed university in Pune, India. Ethical approval for the study was obtained from the Institutional Ethics Committee of the respective institution (approval number DYPCPT/ISEC/44/2022, dated 1 September 2022). Eligible participants were adults aged 18 to 40 years who exhibited latent trigger points in the unilateral hamstring and quadratus lumborum muscles and whose occupations involved prolonged periods of standing or sitting. Individuals were excluded if they had a history of lower back injury or herniated disc, systemic or localized infections, neurological, psychological, or orthopaedic conditions, fractures, malignancies, or open wounds in the treatment area.

All participants were thoroughly informed about the study's objectives, procedures, and any potential risks and benefits, and each provided written informed consent prior to enrollment. The sample size was determined using WinPEPI software (Version 11.38), based on the reported mean and standard deviation of the pain pressure threshold (PPT) for latent myofascial trigger points in the quadratus lumborum, as described by Njoo and Van der Does (1994). A total of thirty participants were recruited and randomly allocated to either the Experimental or Control group using a computer-generated simple randomization method with equal group distribution (1:1).

To maintain allocation concealment, an independent researcher, uninvolved in participant recruitment or outcome assessment, administered group assignments, which were concealed until after enrolment. Although participant blinding was not feasible due to the nature of the intervention, the statistician conducting the data analysis remained blinded to participant identities and group assignments, ensuring an assessor-blinded protocol. Neutral and non-leading language was employed throughout recruitment and interactions to minimize bias and avoid influencing participants' expectations. Baseline demographic information was recorded for all participants. The study maintained complete data records, with no missing values for any variables, thereby reducing the likelihood of bias associated with incomplete datasets.

Outcome measures:

- **Pressure Algometer:** A reliable, valid, cost-effective tool for measuring tenderness and treatment effects in myofascial and musculoskeletal pain, with excellent test-retest reliability (ICC = 0.84) and good intraclass correlation (ICC = 0.75). The Pain Pressure

Threshold (PPT) usually falls between 2 to 4 kg/cm² (or around 20–40 kPa), varying based on the body part tested, as well as factors like age and gender [11].

- **Active Knee Extension:** In a supine position with 90-degree hip flexion, the subject actively extends the knee while a goniometer measures the knee extension angle, reflecting hamstring muscle length. In normal cases, the knee is able to fully extend, reaching a neutral position of 0°. Some individuals may naturally exhibit a slight hyperextension, which can extend up to 5°, and this is considered within the normal range [12]
- **Modified Schober Test:** The subject stands against a wall with arms at sides, and the middle finger position is marked. The subject bends sideways, maintaining wall contact, and the distance between the initial and final finger positions is recorded after two attempts on each side. In healthy adults, a normal increase in the distance between reference points usually exceeds 20 cm, reflecting good lumbar mobility. A smaller measurement may indicate limited spinal flexibility, potentially due to musculoskeletal issues. Measurements below 15 cm often require further assessment, especially when associated with persistent lower back pain or morning stiffness [13].

Intervention

Experimental Group: For Group A participants, IASTM treatment was given 2 times a week, for 4 weeks. Warm-up of 3–5 minutes and hot pack was applied to the treatment region. The IASTM therapy embraces numerous strokes which were given over the Hamstring and quadratus lumborum in prone lying position in the direction of origin to insertion or vice versa and along the line of tissue tension (straight or spiral). The therapist treated the area with the edge tool by combining sweeping strokes and burst strokes using the beveled surface of the tool (w1.5 cm wide), along the direction and line of most resistance. The therapist treated the entire muscle, focusing particularly on areas with increased tension. Light but sustained pressure was applied using the bevelled surface during the scrubbing motion. The technique used in the study allows for longer treatment durations with less irritation to the treated soft tissues. Following the IASTM treatment, a stretching program for the hamstring and quadratus lumborum was implemented with the goal of lengthening the shortened tissues and preventing re-injury. Along with IASTM, conventional exercises (Table 1) were prescribed.

CORE EXERCISES		
1) Crunches	10 REPITION	2SETS
2)Obliques	10 REPITION	2 SETS
3)Superman	10 REPITION	2 SETS
4)Planks	10 REPITION	2 SETS
LUMABR STABILIZATION EXERCISES		
1) Static Back	10 REPITION	2 SETS
2) Bird Dog	10 REPITION	2 SETS
3) Cat and Camel	10 REPITION	2 SETS
4) Pelvic bridging	10 REPITION	2 SETS
STRETCHING		
Quadratus	3 REPITIONS with 30 second hold	
Hamstring	3 REPITIONS with 30 second hold	

Table 1: Conventional exercise Protocol

- Ergonomic advice was given after the conventional treatment regarding posture and body.
- After two weeks all exercise were progressed to 3 sets per day for two weeks
- ***Control Group:*** Group B received warm up for 3-5mins along with Hot pack for 10minss. This was followed by Conventional exercises (Table 1) for 2 days a week for 4 weeks. Progression was added after two weeks.

STATISTICAL ANALYSIS

The software used for statistical analysis was SPSS (version 27.0) and GraphPad Prism (version 7.0). Descriptive and inferential statistics were analyzed using the chi-square test, student's paired and unpaired t-test. The level of significance was set as $p<0.05$. The Chi-Square Test is a statistical method to determine if there's a significant association between two categorical variables or if observed data fits an expected distribution. The Student's Paired t-Test compares the means of two related groups to determine if there's a significant difference. The Unpaired t-Test (or independent t-Test) compares the means of two independent groups to check for significant differences.

Table 2: Distribution of patients in two groups according to their age and gender

Age Group (yrs)	IASTM Group (%)	Control Group (%)
20-30	13 (86.66%)	9 (60%)
31-40	2 (13.34%)	6 (40%)
Total	15 (100%)	15 (100%)
Mean ± SD	25.53 ± 3.83	30.80 ± 6.42
Range	20-32	22-40
p-value	P>6.66,	P>0.08
Gender	13 (86.67%) Male	12 (80%) Male
	2 (13.33%) Female	3 (20%) Female
p-value	P>0.24	P>0.62

Inference: Table 2 shows that the IASTM group has a higher percentage of patients in the 20-30 years age range (86.66%) compared to the control group (60%), while the control group has more patients in the 31-40 years range (40%). The age difference is not statistically significant ($p = 0.08$), and there is no significant gender difference between the groups ($p = 0.62$).

Table 3: Comparison of Active Knee extension on the right and left side at pre- and post-treatment in two groups

Side	IASTM Group	Control Group	t-value	p-value
Right Pre Test	67.53±5.28	60.60±6.46	3.21	<0.003
Right Post Test	82.66±3.35	74.06±6.78	4.40	<0.0001
Left Pre Test	69.86±4.05	62.13±8.09	3.30	<0.003
Left Post Test	84.53±3.04	75.66±7.26	4.35	<0.0001

Inference: Table 3 depicts the mean values of AKE for the right side before and after treatment as 67.53 and 82.66, and for the left side before and after treatment as 69.86 and 84.53, which proves that both values are statistically significant ($p < 0.0001$) using Independent T test was normally distributed.

Table 4: Comparison of pain pressure threshold QL in the right and left side at pre- and post-treatment in two groups

Side	IASTM Group	Control Group	t-value	p-value
Right Pre Test	2.55±0.82	3.55±1.21	2.64	<0.013
Right Post Test	6.72±0.53	4.26±1.01	8.24	< 0.0001
Left Pre Test	2.49±0.83	3.52±1.12	2.84	<0.008
Left Post Test	7.16±0.12	4.54±0.7	-11.132	< 0.0001

Inference: Table 4 depicts the mean values of pain pressure threshold for the right side before and after treatment as 2.55 ± 0.82 and 6.72 ± 0.53, and for the left side before and after treatment as 2.49 ± 0.83 and 7.16 ± 0.12, which proves that both values are statistically significant ($p < 0.0001$) using Independent T test was normally distributed.

Table 5: Comparison of pain pressure threshold HAMS in the right and left side at pre- and post-treatment in two groups

Side	IASTM Group	Control Group	t-value	p-value
Right Pre Test	2.84±1.16	3.53±0.84	1.84	0.075
Right Post Test	5.21±1.03	4.34±0.64	2.75	0.0101
Left Pre Test	2.95±0.78	3.58±1.10	1.79	0.08
Left Post Test	7.3±0.66	4.74±0.99	8.29	0.0001

Inference: Table 5 depicts the mean values of pain pressure threshold for the right side before and after treatment as 2.84 ± 1.16 and 5.21 ± 1.03, and for the left side before and after treatment as 2.95 ± 0.78 and 7.30 ± 0.66, which proves that both values are statistically significant ($p < 0.0001$) using Independent T test was normally distributed.

Table 6: Comparison of Lateral Flexion (cm) in the right and left side at pre- and post-treatment in two groups

Side	IASTM Group	Control Group	t-value	p-value
Right Pre Test	12±4.50	12.26±4.94	0.15	0.87
Right Post Test	24.86±4.18	17.4±4.2	4.86	0.0001
Left Pre Test	11.80±4.19	11.53±4.47	0.16	0.86
Left Post Test	24.86±2.79	16.93±2.91	7.60	0.0001

Inference: Table 6 depicts the mean values of lateral flexion for the right side before and after treatment as 12 ± 4.50 and 24.86 ± 4.18, and for the left side before and after treatment as 11.80 ± 4.19 and 24.86 ± 2.79, which proves that both values are statistically significant ($p < 0.0001$) using Independent T test as the data was normally distributed.

RESULT

As presented in Table 2, the IASTM group exhibits a higher proportion of patients aged 20–30 years (86.66%) compared to the control group (60%). Conversely, the Control group has higher number of individuals in 31–40-year age bracket (40%). However, the observed age distribution differences between the two groups are not statistically significant ($p = 0.08$). Additionally, no significant gender differences were noted between the groups ($p = 0.62$).

Table 3 illustrates the mean AKE values for both the right and left sides before and after treatment. The right side showed an improvement from 67.53° to 82.66°, while the left side increased from 69.86° to 84.53°. These improvements were statistically significant ($p < 0.0001$), indicating a marked enhancement in knee extension following the intervention.

Table 4 details the mean PPT values for the right and left sides before and after treatment. The right side exhibited an increase from 2.55 ± 0.82 to 6.72 ± 0.53, and the left side from 2.49 ± 0.83 to 7.16 ± 0.12. Both changes were statistically significant ($p < 0.0001$), reflecting a substantial reduction in pain sensitivity post-treatment.

Similarly, Table 5 presents additional PPT data, revealing increases from 2.84 ± 1.16 to 5.21 ± 1.03 on the right side and from 2.95 ± 0.78 to 7.30 ± 0.66 on the left side. These differences were also statistically significant ($p < 0.0001$), confirming effectiveness of the intervention in enhancing pain thresholds.

Table 6, A significant improvement in lateral flexion was observed on both sides following treatment. The mean lateral flexion on the right side increased from 12 ± 4.50 to 24.86 ± 4.18, while on the left side it increased from 11.80 ± 4.19 to 24.86 ± 2.79. These differences were statistically significant ($p < 0.0001$), as determined by an Independent T-test, indicating a substantial effect of the treatment on lateral flexion.

DISCUSSION

The present study was conducted on Individuals suffering from non-specific LBP, comprising 30 participants who were randomly assigned to two groups: Experimental and Control. Pain intensity was evaluated using pressure algometry, while hamstring muscle flexibility was assessed through the AKET. The Modified Schober test was utilized to measure spinal lateral flexion, specifically focusing on the quadratus lumborum muscle. Pre- and post-intervention measurements were taken for all outcome variables.

In Group A (EG), IASTM led to a significant reduction in trigger point pain in the quadratus lumborum and hamstring muscles, along with improved spinal lateral flexibility (modified Schober's test) and hamstring flexibility (active knee extension test) compared to the control group (Group B). These benefits are likely due to the mechanical breakdown of scar tissue and adhesions, which decreases soft tissue stiffness and enhances range of motion. Moreover, IASTM promotes increased blood flow and microvascular changes, aiding in the delivery of oxygen and nutrients while facilitating the removal of waste products and inflammatory mediators. It also activates fibroblasts, encouraging collagen development and tissue repair, which supports faster recovery. [10]

According to Prentice et.al. (2012), Instrument Assisted Soft Tissue Mobilization (IASTM) may exert its analgesic effects through the activation of A-beta sensory fibers, which are known to inhibit nociceptive signaling by modulating the activity of A-delta and C-fibers. This mechanism is consistent with the gate control theory of pain, which suggests that stimulation of non-nociceptive afferents can effectively "close the gate" to pain transmission at the spinal level. Specifically, within the dorsal horn of the spinal cord, presynaptic inhibition plays a critical role in attenuating the release of substance P from primary afferent nociceptors, thereby reducing the perception of pain. [14]

Moon J.H. et al. (2017) investigated the immediate effects of the Graston technique, a form of Instrument Assisted Soft Tissue Mobilization (IASTM), on hamstring muscle extensibility and pain intensity in individuals with nonspecific low back pain. The study reported that IASTM, when applied by trained clinicians, effectively disrupted fascial adhesions that limited muscular flexibility. The therapeutic mechanism involves the induction of controlled microtrauma to the soft tissue, which initiates a localized inflammatory response. This response facilitates the synthesis and reorganization of collagen fibers, thereby enhancing tissue remodeling. As a result, patients experienced both a reduction in pain and an improvement in range of motion [15]

A study by Dawn T. Gulick et al. (2017) examined the effect of Instrument-Assisted Soft Tissue Mobilization (IASTM) on increasing the trigger point pain pressure threshold (PPT). This increase in PPT may be attributed to a reduction in adhesions within the myofascial trigger point [16]. IASTM treatment significantly reduced quadratus lumborum trigger points, alleviated pain, and improved muscle flexibility, as shown by the lateral flexion test. This effect was more pronounced compared to conventional therapy. The study emphasizes the quadratus lumborum's role as a lumbar stabilizer and its involvement in unilateral lateral flexion. When the trigger points are released, the muscle regains its functional mobility, because trigger points are the tender points that are formed due to overuse or direct trauma to the muscle, when muscle fibers, fascia, ligaments, or tendons are subjected to excessive strain, weakening, or inflammation, microtears can develop within the affected soft tissues. During the healing process, these tissues often undergo contraction, resulting in the formation of fibrotic, knotted structures. Such myofascial adhesions can impede adequate perfusion, thereby limiting the delivery of oxygen and nutrients essential for optimal muscle cell function. Additionally, as a protective response to prevent further injury, the muscle fibers may undergo adaptive shortening, contributing to increased stiffness and functional limitations. As a result, it prevents the lengthening of the muscle and weakens the muscle, resulting in pain and a restricted range of motion. Additionally, factors such as structural imbalances, improper body mechanics, and poor nutrition lead to the formation of trigger points [17,18,19].

Jooyoung Kim et al. (2017) examined the therapeutic potential of Instrument-Assisted Soft Tissue Mobilization (IASTM) in the management of soft tissue injuries, highlighting its capacity to enhance tissue extensibility by alleviating mechanical restrictions. The friction generated during IASTM application produces localized heat, which reduces the viscosity of the soft tissues, thereby increasing their pliability. This physiological change contributes to improved range of motion (ROM). Furthermore, notable enhancements in ROM post-IASTM may also be explained by neurophysiological mechanisms. Specifically, the application of mechanical stress to the fascial tissue stimulates intrafascial mechanoreceptors, which in turn modulate proprioceptive signaling to the central nervous system. This altered sensory input can influence the activity of motor units, thereby reduce tissue tension and promote functional recovery. [20]

In a 2016 study by Konstantinos Fousekis et al., the effectiveness of Instrument-Assisted Soft Tissue Mobilization (IASTM), cupping, and ischemic pressure techniques was evaluated in the treatment of myofascial trigger points among amateur athletes. The observed reduction in pain and improvement in functional outcomes following IASTM application can be theoretically explained by three principal mechanisms discussed in the literature. First, the technique promotes a localized increase in temperature and enhances blood flow to the targeted region, thereby facilitating tissue recovery. Second, mechanical stimulation through tissue manipulation and stretching contributes to neuromuscular modulation and improved mobility. Lastly, IASTM plays a significant role in breaking down fascial adhesions and restrictions. The release of these adhesions is believed to alleviate mechanical stress on the underlying structures, thereby diminishing fascial tension. This cascade of effects ultimately leads to pain relief and restoration of function. Thus, IASTM has been recognized as an effective modality for addressing soft tissue restrictions and improving fascial mobility within the musculoskeletal system. [21]

The control group, which received only conventional exercises for non-specific low back pain did not show significant improvements compared to the IASTM group. These exercises are less effective in releasing fascia and alleviating trigger point pain. Additionally, control group patients were less motivated due to the lack of new treatment and delayed results, whereas the IASTM group experienced noticeable improvements in pain reduction and range of motion after each session, enhancing motivation.

The study concludes that IASTM significantly improves active knee extension (AKE), pain pressure threshold (PPT), and spinal lateral flexion. While conventional exercises also offer benefits in these areas, their effects are less pronounced than those of IASTM. IASTM reduces trigger point pain in the hamstrings and quadratus lumborum by increasing flexibility, which relieves stress on the lumbar spine. Enhanced hamstring flexibility reduces lumbar strain, and relaxed quadratus lumborum decreases lumbar lordosis, reducing spinal load during prolonged sitting or standing. Thus, IASTM, combined with conventional therapy, proves highly effective for managing non-specific LBP. Future research should explore the long-term effects of IASTM, its efficacy across diverse populations, and its comparison with other manual therapy techniques. Additionally, studies with larger sample sizes and longer follow-up periods are needed to validate these findings. Limitations of the study are a relatively small sample size, potential variability in patient adherence to home protocols, and the lack of blinding, which may have influenced the outcomes. Despite these limitations, IASTM, when combined with conventional therapy, demonstrates significant potential for managing non-specific LBP.

CONCLUSION

The study concludes that IASTM shows significant improvement in AKET, PPT, and Spinal lateral flexion. Similarly, conventional exercises also have a benefit in improving AKE, PPT, and Spinal lateral flexion. However, IASTM is more effective than conventional exercises in improving all these measures.

Declaration by Authors

Ethical Approval: DYPCPT/ISEC/44/2022

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REFERENCES

1. Sahoo KC, Sahu PC, Chattopadhyay K, Sahu PK, Nayak HK. Prevalence of low back pain among adult population in India: a systematic review and meta-analysis. *J Back Musculoskelet Rehabil.* 2022;35(3): 411–22. doi:10.3233/BMR-200345.
2. Kneppers S. The effectiveness of chiropractic manipulative therapy on quadratus lumborum muscle spasm in the treatment of chronic mechanical lower back pain [master's thesis]. Johannesburg: University of Johannesburg; 2009.
3. Krismer M, Van Tulder M. Low back pain (non-specific). Best Pract Res Clin Rheumatol. 2007;21(1):77–91.
4. Puolakka K, Ylinen J, Neva MH, Kautiainen H, Häkkinen A. Risk factors for back pain-related loss of working time after surgery for lumbar disc herniation: a 5-year follow-up study. Eur Spine J. 2008;17(3):386–92.
5. Barreto Silva A, Malheiro N, Oliveira B, et al. Efficacy of ultrasound-guided infiltration with levobupivacaine and triamcinolone for myofascial pain syndrome of the quadratus lumborum: a retrospective observational study. Braz J Anesthesiol. 2021. doi: 10.1016/j.bjane.2021.06.026
6. Tozzi P, Bongiorno D, Vitturini C. Fascial release effects on patients with non-specific cervical or lumbar pain. J Bodyw Mov Ther. 2011;15(4):405–16.
7. Sadler SG, Spink MJ, Ho A, De Jonge XJ, Chuter VH. Restriction in lateral bending range of motion, lumbar lordosis, and hamstring flexibility predicts the development of low back pain: a systematic review of prospective cohort studies. BMC Musculoskelet Disord. 2017;18(1):1–5.
8. Holanda LJ, Fernandes AH, Cabral AC, Júnior FS. Pathophysiology of myofascial trigger points: a review of literature. Int J Basic Appl Sci. 2015;4(1):73.
9. Bron C, Dommerholt JD. Etiology of myofascial trigger points. Curr Pain Headache Rep. 2012;16(5):439–44.
10. Cheatham SW, Lee M, Cain M, Baker R. The efficacy of instrument assisted soft tissue mobilization: a systematic review. *J Can Chiropr Assoc.* 2016;60(3):200–11.
11. Park G, Kim CW, Park SB, Kim MJ, Jang SH. Reliability and usefulness of the pressure pain threshold measurement in patients with myofascial pain. Ann Rehabil Med. 2011;35(3):412–7.
12. Malliaropoulos N, Kakoura L, Tsitas K, et al. Active knee range of motion assessment in elite track and field athletes: normative values. Muscles Ligaments Tendons J. 2015; 5(3):203–7.
13. Malik K, Sahay P, Saha S, Das RK. Normative values of modified-modified Schober test in measuring lumbar flexion and extension: a cross-sectional study. Int J Health Sci Res. 2016;6(7):178–84.
14. Prentice WE, Quillen WS, Underwood FB. Therapeutic modalities in rehabilitation. 5th ed. New York: McGraw-Hill; 2005.
15. Moon JH, Jung JH, Won YS, Cho HY. Immediate effects of Graston technique on hamstring muscle extensibility and pain intensity in patients with nonspecific low back pain. J Phys Ther Sci. 2017;29(2):224–7.
16. Gulick DT. Instrument-assisted soft tissue mobilization increases myofascial trigger point pain threshold. J Bodyw Mov Ther. 2018;22(2):341–5.
17. Markovic G, Mikulic P, Duric V, Milosevic M. The effects of instrument-assisted soft tissue mobilization on pain and range of

motion in individuals with low back pain: a randomized controlled trial. *J Back Musculoskelet Rehabil.* 2021;34(6):987–94. doi:10.3233/BMR-200198

18. Dommerholt J, Gerwin RD. A critical overview of the current myofascial pain literature – January 2015. *J Bodyw Mov Ther.* 2015;19(2):344–56. doi: 10.1016/j.jbmt.2015.02.007
19. Willard FH, Vleeming A, Schuenke MD, Danneels L, Schleip R. The thoracolumbar fascia: anatomy, function and clinical considerations. *J Anat.* 2012;221(6):507–36. doi:10.1111/j.1469-7580.2012. 01511.x
20. Kim J, Sung DJ, Lee J. Therapeutic effectiveness of instrument-assisted soft tissue mobilization for soft tissue injury: mechanisms and practical application. J Exerc Rehabil. 2017;13(1):12–22.
21. Fousekis K, Kounavi E, Doriadis S, Mylonas K, Kallistratos E. The effectiveness of instrument-assisted soft tissue mobilization technique (Ergon technique), cupping and ischemic pressure techniques in the treatment of amateur athletes' myofascial trigger points. J Nov Physiother. 2016;3(2):1–7.

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