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THE EFFECTIVENESS OF INSTRUMENT-ASSISTED SOFT TISSUE MOBILIZATION TECHNIQUE ON MUSCULOSKELETAL SOFT TISSUE INJURIES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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ABSTRACT

Objective: This systematic review and meta-analysis was conducted to determine the impact of IASTM on musculoskeletal soft tissue injuries.

Materials and Methods: In order to find terms like "instrument," "assisted," "soft tissue dysfunction AND wrist, back, elbow, knee, ankle and foot", "interventions AND IASTM," studies from conception to December 2021 were systematically analyzed across seven electronic databases: Medline, PubMed, Cochrane Library, Google Scholar, Scopus, PEDro, and Web of Science. The inclusion criteria for the systematic review were thus met by (n=14) randomized controlled studies.

Results: IASTM treatments are associated with both short and long-term pain reduction and improved functioning. IASTM was discovered to have a short-term favorable effect on the functioning of patients with soft tissue injuries.

Conclusion: It was established that IASTM had a short-term positive impact on the functionality of individuals with soft tissue injuries in different body regions. Future researches should focus on acquiring information about long-term effects using credible evidence.

Introduction

Soft tissue injuries are a prevalent and major source of morbidity in both the general public and sportsmen[1]. The bulk of these disorders are caused by muscle-tendon overload, or when ligaments are torn as a result of excessive exercise or improper training practices[2]. Contusion, sprains, strains, tendinitis, and stress injuries are by far the most prevalent soft injuries among athletes and non-athletes[3] while ankle sprains being the most common. In addition to it, Achilles tendon rupture, tendinopathies, plantar fascia and retro-calcaneal bursitis are also prominent causes of ankle discomfort that can lead to subsequent problems[4, 5].

Manual therapy comprises a vast range of treatments that may be divided into many major categories, such as manipulation, mobilization, muscle energy techniques etc. Whereas, static stretching and soft tissue mobilization are the two most popular manual therapy techniques used

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by therapists in the care of acute and chronic ankle and foot soft tissue injuries[6]. Despite this, several studies have shown joint mobilization and manipulation as an effective treatment for ankle and foot soft tissue injuries along with the PRICE (Protection, Rest, Ice, Compression, and Elevation) strengthening, proprioceptive and functional exercise as an adjunct[7,8]. Furthermore, American Physical Therapy Association (APTA) is actively developing evidence-based practice guidelines for clinicians dealing with musculoskeletal conditions for operative management[9].

According to recent studies, Instrument-Assisted Soft Tissue Mobilization (IASTM) is a new and highly trained myofascial technique that has gained favor in modern decades for treating soft-tissue ailments[10]. IASTM method involves utilizing an instrument to eradicate scar tissue that has developed in soft tissues and stimulating fibroblasts to help in the healing process. This strategy not only relieves pain but also aids in the application of deep pressure for a bigger effect by covering a broader region[11]. This allows clinicians to get a more limited and thorough reach of tissues. Furthermore, IASTM may improve patients' function, and reduce discomfort in the short term after acute and chronic soft tissue injuries[12]. Moreover, it can also be used to treat non-pathological diseases such as muscle tightness, DOMS (Delayed Onset Muscle Soreness), as it affects flexibility and range of motion[13-14]. Such advantages might be useful in sports recuperation and athletic training.

IASTM's popularity has also resulted in a growing corpus of studies on its efficacy[15]. Higher-level controlled studies have recently been published, with researchers exploring the effects of IASTM on musculoskeletal pathologies[16,21]. Its exact effects on soft tissue injuries, on the other hand, remain uncertain. This is due to the fact that the conclusions and key outcomes of pertinent research papers have been shown to vary. Despite the fact that numerous studies have examined the advantages of IASTM in treating neck pain as well as other conditions, research on the treatment of soft issue injuries to the ankle and foot has been limited or non-existent. The consequences of combining this method with other tactics are unclear at this time. Taking into mind the aforementioned scientific void, this review investigated the existing studies to determine the impact of IASTM as a skilled intervention to improve soft tissue function and joint ROM after an injury.

Methodology

Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines were followed for conducting this review[22].

Search Strategies

The studies were systematically analyzed from their inception until December 2021 using seven electronic databases: MEDLINE, PubMed, Cochrane Library, Google Scholar, Scopus, PEDro, and Web of Science. On the basis of publication dates and language, filters were used. The authors used Medical Subject Headings (MeSH) to locate synonyms for words like "instrument," "assisted," "soft-tissue dysfunction AND wrist, back, elbow, knee, ankle and foot," "interventions AND IASTM," "IASTM NOT Gua Sha," and "IASTM NOT ASTYM" in their searches. The terms "Gua Sha" and "ASTYM" were not included in this search. These treatments are similar to IASTM, but they have different administration, and explanations for the treatment, as well as the outcome metrics.

Eligibility Criteria

The effectiveness of IASTM technique for patients with soft tissue injuries in different regions of the body was assessed. To select titles, the abbreviation 'PICO' i.e. Patients/Problem, Interventions/Exposure, Comparisons, and Outcomes was employed. Therefore, in patients with soft tissue injuries of the wrist, back, elbow, knee, ankle and foot, the results of IASTM treatments were contrasted with those of other interventions such as rest, ice, cryotherapy, early mobilization, and progressive resistance exercises. Experimental studies that included subjects of any age with clinically determined soft tissue injuries and were published in English after peer review were acceptable. Case reports, case series, clinical comments, dissertations, conference posters, abstracts, and studies that used clinically unsuitable outcome measures for the disease being treated were excluded. Despite the fact that certain therapies may be difficult to comprehend, the review committee determined that the lack of literature justified their inclusion.

Assessment of Risk of Bias

The publications were analyzed to rule out systematic errors using the Cochrane Manual for Systematic Review of Interventions under domains of selection bias, performance bias, detection bias, attrition bias and reporting bias to predict high, low or unknown risks.

Quantitative Analysis

The analysis was carried out using the statistical software named MedCalc-version 18.11.3. The assumptions of heterogeneity and Standardized Mean Difference (SMD) across groups with pooled S.D. were examined using a random effect model with a 95% Confidence Interval. Cohen's rule of thumb categories was used to classify the effect size as small = 0.2 to 0.5, medium = 0.5 to 0.8, and large = ≥0.8. The degree of study heterogeneity was determined using I^2 statistics, with a significant value of $p<0.05$.

Outcome Measures

Individual functional markers of the ankle joint, such as the patient's pain perception, range of motion and overall function, were employed as outcome measures for reporting the IASTM treatments' effectiveness.

Results

The systematic search yielded a total of (n=189) studies, of which (n=139) were chosen after careful consideration of the titles and abstracts' relevance to the review's topic. Articles that appeared in multiple search engines were deleted (n=50), while studies that included IASTM as a therapeutic component survived (n=39). Furthermore, (n=20) papers were excluded because only (n=14) publications met the inclusion criteria for the review as shown in (Figure-1).

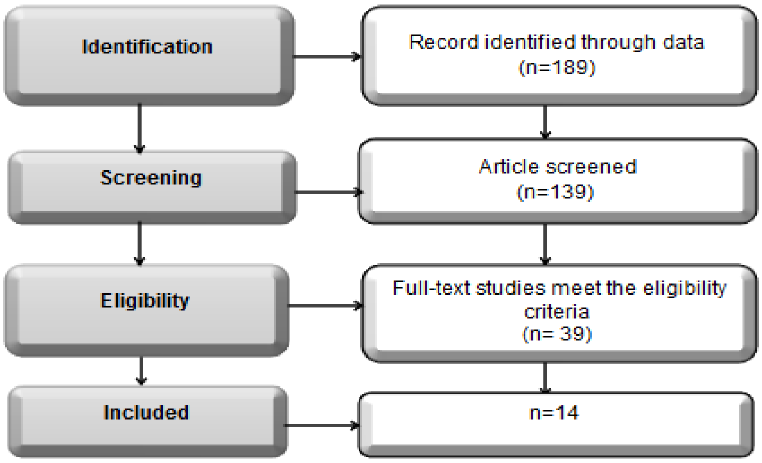

Figure-1 PRISMA Flow Diagram

As shown in Table-2, 14 studies employed randomized controlled trials. Participants were divided into the intervention and control groups in practically all of the trials. Despite certain similarities, there are undoubtedly substantial discrepancies that have affected the study's conclusions. The diagnostic criteria (examination), the outcome evaluation, and the finding that neither arm (intervention or control) produced any differences at baseline were shared by both trials. The FAAM, VAS, and goniometer were usually employed in studies for ROM reasons, with the exception of one study that used the SEBT for balance. The intervention, which lasted between 4 and 8 weeks, had a significant impact. The proportion of women in the studies was much greater than the proportion of males. Furthermore, the number of participants varied between studies. Lastly, in certain studies, the frequency of re-evaluation was low, and some studies did not re-evaluate at all.

Meta-Analysis

Visual Analog Scale: In (n=8) randomized controlled trials, the IASTM intervention showed a significant reduction in pain. According to the Cohen rule of thumb, the pool effects of IASTM intervention in terms of SMD had an impact of 0.533 in a random effect model (Table-2), indicating that it had a moderate impact on pain relief. Additionally, the forest plot was employed to depict the pool effects in the random effect model at a 95% Confidence Level (Estimation of heterogeneity: Q=13.9576, I^2=78.51%) in Figure-2.

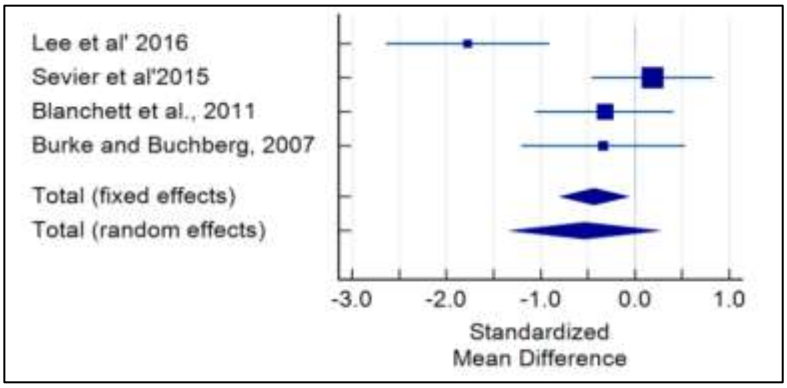

Figure-2 Forest plot indicating effects of IASTM intervention on VAS

Rom: The pooled effects of IASTM management in (n=8) trials showed a significant improvement in ROM in terms of SMD with an impact of 0.507 in a random effect model which by Cohen's rule of thumb denotes a moderate effect of IASTM in enhancing ROM (Table-3). The forest plot depicted the pool effects in the random effect model at 95% Confidence Interval (Estimation of heterogeneity: Q=9.5718 and I^2=68.66%) in Figure-3.

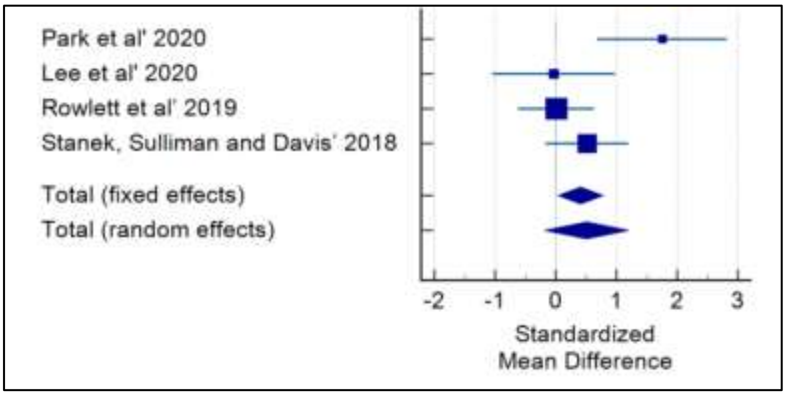

Figure-3 Forest plot indicating effects of IASTM intervention on ROM

Author' Year	Sample Size	Target Population	Study Design	Outcome Measure	Intervention: Intervention Group	Intervention: Control Group	Results
Bhurchandi et al' 2021[25]	70	Participants with heel pain	Randomized Controlled Trial	Numerical Pain Rating Scale, Foot & Ankle Ability Measure Scale	IASTM + Home exercise program	Therapeutic Ultrasound + Home exercise program	IASTM and home exercise program improved the foot function and reduce pain
Nikam and Varadharajul' 2020[26]	100	18 to 25 years old with a minimum deficit of 15° in knee extension and 90° in hip flexion	Randomized Controlled Trial	Active Knee Extension, Hamstring Flexibility Test	IASTM performed on hamstrings utilizing the M2T blade® and a topical muscle relaxant	Active stretching of the hamstrings for 6 days/week	Significant improvement in extensibility of hamstring muscles
Park et al' 2020[27]	20	Taekwondo players with chronic ankle instability	Randomized Controlled Trial	Goniometer, Dynamometer and Plantar Foot pressure Measuring Device	IASTM rehabilitation exercises for 4 times/week for 8-weeks	No exercise intervention	IASTM enhances body balance, muscle strength, and ankle stability
Lee et al' 2020[28]	16	Recreational active individuals	Randomized Prospective Cohort	Active and Passive ROM	IASTM with Graston tools and a roller massage stick	Roller massage stick	Both IASTM and the roller massaging stick increased active and passive ROM
Ikeda et al' 2019[29]	14	Healthy volunteers	Randomized, Controlled, Crossover Study	Dorsiflexion Range of Motion and Stretch, Tolerance Torque	IASTM applied to the back of the lower thigh	Participants had pre and post measurements without IASTM on different days	ROM increased substantially by 10.7% and ankle joint stiffness declined by 6.2%
Rowlett et al' 2019[30]	40	Healthy individuals aged 18-65 years	Randomized Controlled Trial	Dorsiflexion Range of Motion	The gastrocnemius -soleus complex received IASTM	Passive Static Stretching	The soleus muscle's flexibility appears to be more impacted by IASTM and stretching
Carlson, Rife and Williams' 2019[31]	Not mentioned	Healthy individuals aged 18 years	Randomized Controlled Trial	Goniometer	IASTM applied on Achilles tendon along with calf stretch & raises on 30˚ slant board	Calf stretch & raises on 30˚ slant board	Stretching has significant effect on ankle dorsiflexion
Stanek, Sulliman and Davis' 2018[32]	44	Physically active people with less than 30° of DF	Randomized Controlled Trial	Standing and kneeling ankle Dorsiflexion	IASTM along with Compressive Myofascial Release	Dorsiflexion ROM	CMR has significant effect after a single session a on DF ROM than Gastron technique
Lee et al' 2016[33]	30	Chronic low back pain	Randomized Controlled Trial	VAS and ROM	Graston Technique Protocol for 4-weeks	. General exercises for 10-15 minutes, 3 sets of 15	Graston group showed significantly increased VAS and ROM

						repetitions for 4-weeks	
Bayliss et al' 2015[34]	2015	6 adults aged ≥30 years with bilaterally shortened Achilles tendons	Randomized Controlled Trial	Ultrasound Imaging and Dynamometry	8 IASTM sessions blended with stretching during a 4-week period	Stretching	Increase in tendon resting length with IASTM treatment
Sevier, et al 2015[35]	107	Patients with chronic lateral elbow tendinopathy	Prospective Randomized Controlled Trial	DASH scores, maximum grip strength and function	IASTM sessions for 2 times/week for 4-weeks	Stretching activities were conducted three times each day, while eccentric strengthening exercises were performed twice a week	IASTM therapy is more efficient than eccentric exercise for treating LE tendinopathy
Blanchette et al' 2011[36]	27	Patient with lateral epicondylitis	Randomized Controlled Trial	VAS and the Patient Rated Tennis Elbow Evaluation	IASTM sessions for 2 times/week for 5-weeks	Suggestions on lateral epicondylitis' natural progression, computer ergonomics, and stretching exercises	Pain-free grip strength and the visual analogue scale both improved in both groups
Schaefer et al' 2012[37]	36	Healthy, physically active individuals	Randomized Controlled Trial	FAAM , FAAM-Sport scores, VAS, Goniometry, ROM and SEBT	Graston Technique Protocol for 4-weeks	Dynamic Balance Training Programme	Both treatment intervention has great effects on ankle instability
Burke et al' 2007[38]	22	Patient with Carpal Tunnel Syndrome	Prospective Comparative	Visual Analog Scale and Self-Reported Ratings of Symptoms, Severity & Functional Status	Graston Technique, 2 times a week for 4-weeks, then once a week for 2-weeks, followed by a home programme	Soft tissue mobilization followed the same duration as intervention group	The techniques did not differ in terms of clinical improvements

Table-1 Characteristic Features of the Included Studies

Study	N1	N2	Total	SMD	SE	95% CI	T	P	Weight (%)	
									Fixed	Random
Lee et al (2016)	15	15	30	-1.773	0.423	-2.639 to -0.907			19.32	23.74
Sevier et al (2015)	14	29	43	0.186	0.320	-0.460 to 0.833			33.67	26.68
Blanchett et al (2011)	15	15	30	-0.318	0.358	-1.051 to 0.415			26.97	25.62
Burke and Buchberg, (2007)	12	10	22	-0.335	0.415	-1.200 to 0.531			20.04	23.96
Total (fixed effects)	56	69	125	-0.433	0.186	-0.800 to -0.0649	-2.329	0.021	100.00	100.00
Total (random effects)	56	69	125	-0.533	0.405	-1.335 to 0.269	-1.315	0.191	100.00	100.00

Table-2 SMD Differences for Studies with VAS outcome

Study	N1	N2	Total	SMD	SE	95% CI	t	P	Weight (%)	
									Fixed	Random
Park et al (2020)	10	10	20	1.755	0.510	0.683 to 2.827			13.92	20.94
Lee et al (2020)	8	8	16	-0.0337	0.473	-1.047 to 0.980			16.23	22.33
Rowlett et al (2019)	20	20	40	0.0128	0.310	-0.615 to 0.640			37.75	28.91
Stanek, Sulliman and Davis' (2018)	17	18	35	0.516	0.336	-0.168 to 1.200			32.09	27.82
Total (fixed effects)	55	56	111	0.409	0.190	0.0320 to 0.787	2.150	0.034	100.00	100.00
Total (random effects)	55	56	111	0.507	0.354	-0.193 to 1.208	1.435	0.154	100.00	100.00

Table-3 SMD Differences for Studies with ROM outcome

Synthesized Findings

In cases of ankle and soft tissue injuries, the IASTM has been shown to lessen chronic pain, boost functioning, increase range of motion, and improve gait pattern. Bhurchandi et al.[25] demonstrated that IASTM had a short and long-term impact on heel pain. According to Nikam and Varadharajulu[26], IASTM utilizing the M2T blade in combination with a topical muscle tissue relaxant like Volteran had much superior outcomes in the muscles of recreational runners. Ikeda et al.29 showed that IASTM effectively decreased ankle joint stiffness and improved dorsiflexion range of motion. Peak passive torque and muscular stiffness, however, remained constant. In repeated evaluations of controls, every factor remained the same. In the study by Rowlett et al.[30] one session of IASTM or stretching enhanced ankle dorsiflexion range of motion in WBLT and MRP[2]. There were no noticeable changes found in MRP1. Improvements in range of motion assessed with the knee flexed suggest that IASTM and stretching tend to have a bigger impact on soleus muscle flexibility. The use of self-stretching to empower patients appeared to be acceptable and beneficial because there were no clinically significant differences between both the intervention groups in weight-bearing circumstances. To increase dorsiflexion range of motion, more research is needed on the advantages of stretching paired with IASTM. The combined impact of tissue flossing and IASTM on ankle dorsiflexion is described by Carlson et al.[31] According to the study; IASTM reduces the risk of injury, improves flexibility and range of motion after surgery, and improves leaping mechanics.

Stanek and colleagues[32] investigated the dorsiflexion deficits, and compressive myofascial release improved ankle dorsiflexion after just one session. It was suggested that clinicians should investigate CMR as a treatment option for patients with mobility deficits. According to Bayliss et al.34 IASTM appears to be a successful approach for changing the material properties of the shortened, healthy Achilles tendon. More study is needed to establish if the modifications produced have an impact on injury risk in injured tendons. Participants in the 4-week treatment programme of the Dynamic-Balance-Training Program aided with Graston Instrument-Assisted Soft-Tissue

Mobilization for chronic ankle instability by Schaefer et al.[37] showed improvement in it. IASTM rehabilitation exercises improved ankle joint mobility, isokinetic muscle strength, and balance in individuals with persistent ankle instability, according to Park et al.[27] For the VAS and ROM; there was a significant time-by-group interaction. The Graston group's discomfort decreased considerably after the intervention, according to a post hoc paired t-test. Both groups' lumbar range of motion improved significantly after the intervention in patient with chronic lower back patients according to Lee et al.[33] although the roller massaging stick is less expensive than the IASTM. Lee et al.[28] claimed that both the IASTM and the roller massaging stick were similarly useful in hamstring range of motion both immediately and over time. IASTM therapy has been shown to be a successful therapeutic alternative for individuals with lateral epicondylitis tendinopathy, as both a primary treatment and after an eccentric exercise regime has failed, according to Sevier et al's research[35] According to Blanchette et al.36 both the IASTM and the natural history approach are impacted in patients with lateral epicondylitis. Burke et al.38 claimed that IASTM and soft tissue mobilization in carpal tunnel syndrome increased wrist strength or its motion, and nerve conduction latencies.

Risk of Bias across Studies

As stated in Table-4, the Cochrane Risk of Bias Tool was used to estimate the potential for bias premised on the author's assessment for each trial that was included.

Selection Bias

Random Sequence Generation

All studies showed lower risk of bias.

Allocation Concealment

In contrast to one study[29] that indicated a significant risk of bias, allocation concealment in nine studies[25,26,27,28,32,33,34,36,37] revealed a low risk of bias. Four studies contained unidentified bias risks[30,31,35,38].

Performance Bias

Blinding of Participants and Personnel

Participants in eleven trials were blinded, demonstrating the low risk of bias[26,27,28,29,31,32,33,34,35,36,38]. One study[37] revealed a high risk of bias, while the bias in the other two[25,30] trials was uncertain.

Detection Bias

Blinding of Outcome Assessment

Blinding of outcome assessment in eight researches [26,27,29,30,31,32,36,38]indicated minimal bias risk, while in six studies [25,28,33,34,35,37] substantial biasness was evident.

Attrition Bias

Incomplete Outcome Data

Incomplete outcome data of seven studies [25,26,27,30,32,35,38] showed low risk whereas high biasness is observed in seven studies [28,29,31,33,34,36,37].

Reporting Bias

Selective Reporting

Reporting bias is low in seven studies[27,28,30,32,33,36,38], high is six[26,29,31,34,35,37] and unknown in one study[25].

Discussion

This review included extensive literature searches and evaluations. The characteristics of the study were then gathered and examined in order to gauge the accuracy of the findings. IASTM techniques were recommended as potent therapeutic approaches for treating soft-tissue injuries based on recent studies. Our results indicate that all studies included in this systematic review used an IASTM approach, either alone or in conjunction with another therapy strategy, which was common to all patients in each study. The results of this review indicate that IASTM treatments are associated with both short and long-term improvements in functioning and pain relief.

Bhurchandi et al.[25] discovered in their investigation that IASTM was superior to therapeutic ultrasound in reducing heel pain and enhancing general functionality. The results show that combining one of the two techniques with exercise training can eventually lead to improved functionality and pain relief. According to Nikam and Varadharajulu, IASTM combined with the use of a topical muscle relaxant may be helpful in addressing tissue extensibility insufficiency of the hamstrings in recreational runners[26]. Additionally; IASTM has a considerable and perceptible impact on soft tissues when combined with stretching exercises. According to Park et al.[27] persistent ankle instability in taekwondo players improved range of motion, isokinetic muscular strength, and balance. IASTM and the roller massaging stick both demonstrated statistically significant improvements in active and passive ROM following a single treatment, according to Lee et al.[28] Ikeda et al.[29] discovered that after just one IASTM treatment, joint stiffness decreased and ankle dorsiflexion increased without changing the mechanical as well as neurological characteristics of the treated muscles.

Author' Year	Random Sequence Generation	Allocation Concealment	Blinding of Participant Personal	Blinding of Outcome Assessment	Incomplete Outcome Data	Reporting Bias
Bhurchandi et al' 2021[25]	+	+	?	-	+	?
Nikam and Varadharajul' 2020[26]	+	+	+	+	+	-
Park et al' 2020[27]	+	+	+	+	+	+
Lee et al' 2020[28]	+	+	+	-	-	+
Ikeda et al' 2019[29]	+	-	+	+	-	-
Rowlett et al' 2019[30]	+	?	?	+	+	+
Carlson, Rife and Williams' 2019[31]	+	?	+	+	-	-
Stanek, Sulliman and Davis' 2018[32]	+	+	+	+	+	+
Lee et al' 2016[33]	+	+	+	-	-	+
Bayliss et al' 2015[34]	+	+	+	-	-	-
Sevier, et al 2015[35]	+	?	+	-	+	-
Blanchette et al' 2011[36]	+	+	+	+	-	+
Schaefer et al' 2012[37]	+	+	-	-	-	-
Burke et al' 2007[38]	+	?	+	+	+	+

Table-4 Bias Potential of Included Studies

Stretching and IASTM are both advised by Rowlett et al.[30] who found no clinically significant differences between the treatment and control groups. The soleus muscle's flexibility is improved by IASTM and stretching, as evidenced by an increase in range of motion when the knee is flexed. Therefore, it seems appropriate and beneficial to empower patients with weight-bearing ailments through self-stretching. Carlson and colleagues[31] emphasized that the danger of injury is decreased following IASTM while improve ankle dorsiflexion leaping mechanics and increase post-surgery flexibility and range of motion, while the author did not differentiate between the particular advantages of both IASTM and tissue flossing. Only Stanek et al.[32] used CMR rather than IASTM to detect an improvement in ankle dorsiflexion. Patients with reduced dorsiflexion experienced an improvement in it after just one session of CMR. Clinicians ought to look into CMR as a potential therapy for dorsiflexion-deficient patients. Lee et al.[33] suggested the significant improvement in ROM and decrease in pain by using IASTM in chronic lower back pain patient. IASTM therapy increased tendon resting length, according to Bayliss et al.[32] In the six patients studied thus far, there was no statistical advantage of IASTM in terms of performance on the lunge test. Sevier et al.[35] have shown effectiveness of IASTM and eccentric exercises in tendinopathy patients. Blanchette et al.[36] also suggest the effect of IASTM on pain in tendinitis patient. Schaefer and colleagues[37] reported that IASTM therapy for chronic ankle instability increased FAAM, FAAM Sport, ROM, and SEBT in both sides but lowered VAS. Burke et al.[38] noted that IASTM had a positive impact on the progression of carpal tunnel syndromes by enhancing wrist strength, wrist motion, and nerve conduction latencies.

This systematic review has a number of evident flaws. Only studies written in English were included, with the opportunity to access the entire text. A further constraining factor is the modest number of empirical researches that met the requirements for inclusion, as well as the challenge of finding high-quality studies with a minimal risk across all evaluation parameters. Because IASTM therapy impacts such a large proportion of the population, it's critical to investigate long-term results. Another issue is that much of the study focuses on short-term therapies. Numerous studies failed to adequately describe the intervention, and some of the results did not properly indicate the risk. Furthermore, several of the publications do not provide a clear path to therapy and include low-quality research. No review study that chronicles emerging trends in enhancing functional activities, range of motion, and discomfort has, as far as the author is aware, been published anywhere in the world. Therefore, the researchers will have to investigate at clinical studies that significantly affected range of motion, flexibility and range of motion if they were to avoid bias and come up with reliable results.

Conclusion

It was established that IASTM had a short-term positive impact on the functionality of individuals with soft tissue injuries. Despite the fact that several of the papers were of low or ambiguous quality. The research on the long-term advantages of IASTM was not properly equipped due to the research design to allow for the establishment of robust and scalable conclusions. Last but not least, future study should focus on acquiring information on long-term consequences using credible evidence.

AUTHORS' CONTRIBUTION:
The following authors have made substantial contributions to the manuscript as under:
Conception or Design: Hafiza Javeria, Danish Rasool, Dr. Ucksy Mallick
Acquisition, Analysis or Interpretation of Data: Hafiza Javeria, Danish Rasool, Dr. Ucksy Mallick
Manuscript Writing & Approval: Hafiza Javeria, Danish Rasool, Dr. Ucksy Mallick
All authors acknowledge their accountability for all facets of the research, ensuring that any concerns regarding the accuracy or integrity of the work are duly investigated and resolved.

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