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EFFECT OF DRY NEEDLING ON PAIN AND CERVICAL RANGE OF MOTION IN PATIENTS WITH UPPER TRAPEZIUS TRIGGER POINTS: A SYSTEMATIC REVIEW

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ABSTRACT

Objectives: This systematic review seeks to provide high-quality evidence on the effect of dry needling on cervical range of motion and pain in patients. The objective of this systematic review was to determine the evidence base for the effect of dry needling on cervical range of motion and pain in patients with upper trapezius trigger points.

Material and methods: A systematic electronic literature search was undertaken utilizing keywords and medical subject heading search phrases in the PubMed/Medline, Cochrane Central, Scopus, and EBSCO databases, as well as Google Scholar. In addition, the reference lists of the systematic reviews included in the study were manually searched. Patient satisfaction and complications were collected from a range of motion prospective and experimental studies that provided the greatest degree of evidence. Articles were evaluated critically, and the methodological index for non-randomized studies scale was used to determine the risk of bias.

Results: This systematic review suggested the use of dry needling to improve pain and functional capacity in patients with chronic neck pain at short- and mid-term intervals. To the interventions, dry needling combined with physical therapy was shown to be effective in decreasing pain, whereas isolated dry needling did not demonstrate significant improvements in the analyzed studies.

Conclusion: Finally, as for pain, dry needling combined with physical therapy was the therapy that showed the most benefits in function in the analyzed studies.

Keywords: Local Twitch Response, Range of Motion, Trigger Points, Upper Trapezius.

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INTRODUCTION

At least 30% of adults worldwide experience cervical discomfort, with a prevalence of 24,439–61,512 instances per 100,000 people [1,2]. Of the patients, 44% acquire chronic symptoms [3], and in terms of frequency and duration [4], this condition is just as significant as lumbar pain. The expense of health care and the economy are increased when an issue becomes chronic [5,6].

According to the Global Burden of Disease Study, neck discomfort ranks fourth in terms of years spent disabled [7]. The first therapeutic option that people with neck pain typically want is physical therapy. Numerous therapies have demonstrated efficacy in the management of neck pain, such as cervical manual therapy [8], exercises [9], and education [10]. Manual therapies in conjunction with exercises are recommended as the therapeutic approach for the appropriate management of these patients according to clinical practice guidelines for physical therapy management of neck discomfort [11,12]. Furthermore, a dearth of studies has examined the use of alternative treatments, such as dry needling, thus clinical practice guidelines do not advocate them. This is not because there is evidence against the particular technique.

Activities involving extended bad postures (e.g., office workers) or repetitive usage of the same muscle area might cause myofascial pain syndrome range of motion [13]. The latter is typified by one or more trigger points, most frequently in the upper trapezius. A trigger point is an extremely sensitive area located within a taut band of skeletal muscle [3]. Individuals that have trigger points are typically identified by the existence of one or more of the symptoms listed below: Local pain, pain that is referred based on a usual pattern, pain that occurs when a muscle is stretched or compressed, a local twitch response brought on by the taut band snapping, decreased force, and a limited range of motion [14]. When these symptoms coexist, one's functionality and quality of life may suffer. Therefore, in individuals with myofascial pain syndrome, pain, range of motion, and functionality are often utilized to gauge how well a treatment is working.

Myofascial trigger point management has been approached from a variety of angles; one of the more popular approaches is dry needling [15]. During the dry needling treatment, a solid, non-beveled, filiform needle is inserted into the myofascial trigger point without any substance being injected or extracted. Dry needling is used to treat several disorders and is known to have a mechanical action that disrupts malfunctioning motor end plates [16]. In the short term, dry needling has been shown to be beneficial in relieving myofascial pain in the upper [17] and lower quarter [18].

There are two varieties of dry needling: Deep and superficial. The superficial technique involves inserting a needle 5 mm deep to block C-fiber pain impulses, which will have an indirect influence on pain. A local twitch response is elicited by deep dry needling, which directly stimulates the afflicted muscle and has several physiological implications [19]. A deeper needle insertion affects the muscle, fascia, and skin and has a more potent analgesic effect than one that merely penetrates the skin and superficial muscle [18,20,21]. The needle can be manipulated like a piston by moving it up and down, or it can be fixed in place for some time [18].

A few earlier assessments looked into how well dry needling worked to inactivate TrPs linked to neck discomfort. Although no quantitative research was done, Cagnie *et al*. stated that dry needling can be advised for the treatment of upper trapezius muscle trigger points [22]. According to Liu *et al*.'s conclusion, trigger point dry needling may be suggested at short- and mid-term follow-ups for the treatment of myofascial origin neck and shoulder discomfort [23]. According to a recent meta-analysis by Kietrys *et al*. [24], dry needling helps patients with neck pain feel better both right away following therapy and 4 weeks later. Nevertheless, there has not been a recent comprehensive review of the literature examining the benefits of dry needling for inpatients experiencing neck pain. Determining the evidence basis for dry needling's impact on cervical range of motion and pain in patients with upper trapezius trigger points was the goal of this review.

Aim

The primary aim of this review was a systematic review of the effect of dry needling on cervical range of motion and pain in patients with upper trapezius trigger points. The secondary aim was to make recommendations for performing future studies.

Objectives

To assess the effect of dry needling on cervical range of motion and pain in patients with upper trapezius trigger points.

METHODS

The present systematic review was registered at the National Institute for Health Research PROSPERO International Prospective Register of Systematic Reviews.

The search protocol is designed based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analysis) guidelines 2009.

SEARCH STRATEGY

We searched the electronic databases of MEDLINE, Embase, Cochrane, Google Scholar, Scopus, and PubMed. Furthermore, a manual search was conducted of the bibliographies of all pertinent publications and textbooks. The pertinent papers were chosen separately by two reviewers based on the inclusion and exclusion criteria. The two reviewers discussed any differences until they came to an agreement. Methodological Medical Subject Heading (MeSH) phrases were produced using the PICO-format question to increase the sensitivity of the search technique in identifying research. The following MeSH phrases and free-text words were combined to form the search strategy: "Trigger Area" OR "Upper trapezius" OR "dry needling" OR "myofascial release" OR "pressure release" AND ("Trigger Points" [(Mesh) OR "trigger point"]). The Web of Science search omitted "[MESH]". Research that complied with these requirements for inclusion was carefully examined. The listed studies' attributes were assessed using a particular quality assessment scale that was proposed.

Inclusion criteria

The study needed to fulfill the following requirements to be accepted:

1. This analysis only included Randomized Control Trial trials
2. Active or latent trigger points in the upper trapezius must be diagnosed in participants experiencing neck pain
3. The use of dry needling, which is an intramuscular method that involves inserting needles into trigger points, is required as an intervention (Dry Needling) [25]
4. Only articles addressing the treatment's therapeutic impact were included
5. All of the articles were in English.

Exclusion criteria

The exclusion criteria included the following:

1. Retrospective studies
2. Cross-sectional study
3. Case reports
4. Case series
5. Animal studies
6. Reviews
7. Abstracts
8. Technical reports
9. Expert opinions
10. Articles with incomplete data.

The references of selected articles were also analyzed for additional studies. Moreover, any study that did not meet the inclusion criteria.

FORMULATING THE REVIEW QUESTION

The research question was set in accordance with the PICO format (Population, Intervention, Comparison, and Outcome) (Table 1).

SELECTION

There were three steps involved in the study selection process. The title and abstract were the only parts of the first phase that were subject to the selection criteria. The complete texts of all potentially qualifying research were obtained. Two impartial reviewers assessed the full-text articles for inclusion in the second step of selection. Full-text articles were retrieved and evaluated for each of the selected abstracts, and the final list of articles was obtained while adhering to the selection criteria (Table 2).

DATA EXTRACTION

Data from all of the range of motion investigations were extracted into an Excel data sheet once the final study sample was established. These included the first author, the year the study was published, the number of individuals, the mean age, the location and stage of the tumor, and the subjects' imaging modality (Fig. 1).

QUALIFICATION OF METHODOLOGICAL QUALITY

To evaluate the methodological quality, the Dutch Cochrane Center and the Dutch Institute for Healthcare Improvement created a checklist for randomized control trials. Three separate, blinded researchers assign a score to each of the included publications. After comparing scores and discussing disputes, a consensus was established. The methodological quality of the included articles was assessed by a quality assessment process. As a result, MINORS – the Methodological Index for Non-Randomized Studies – was validated and employed. Originally designed for review of surgical research, when randomization is not always possible, this tool was created. Nonetheless, conducting a thorough analysis of the current body of work and providing answers to pertinent concerns remained valuable. We concluded that the MINORS index was the best suitable quality assessment index for assessing the papers included in this systematic review after taking into consideration everything mentioned above. This scale allowed the publications to be categorized into non-comparative and comparative research, with each category receiving a distinct score. Each scale component received one of three scores: 0 (not reported), 1 (reported but insufficient), or 2 (reported and adequate). With eight items to be assessed for non-comparative research, the global ideal score is 16, and with four additional items for comparative studies, the global ideal score is 24. All of the included articles were given a score by the first author, who also sought advice from the second when necessary. The two primary reviewers evaluated the comparative studies' statistical analyses, seeking expert advice from a statistician as necessary.

RESULTS

After the first search, 185 articles were found. Ten studies in total were considered for analysis out of the 185 articles found in the database search after duplicates were removed and publications based on eligibility criteria were eliminated.

SYNTHESIS OF RESULTS

Narrative synthesis has been provided for the findings obtained range of motion of the studies. The data extracted has been presented in tabular form (Table 3).

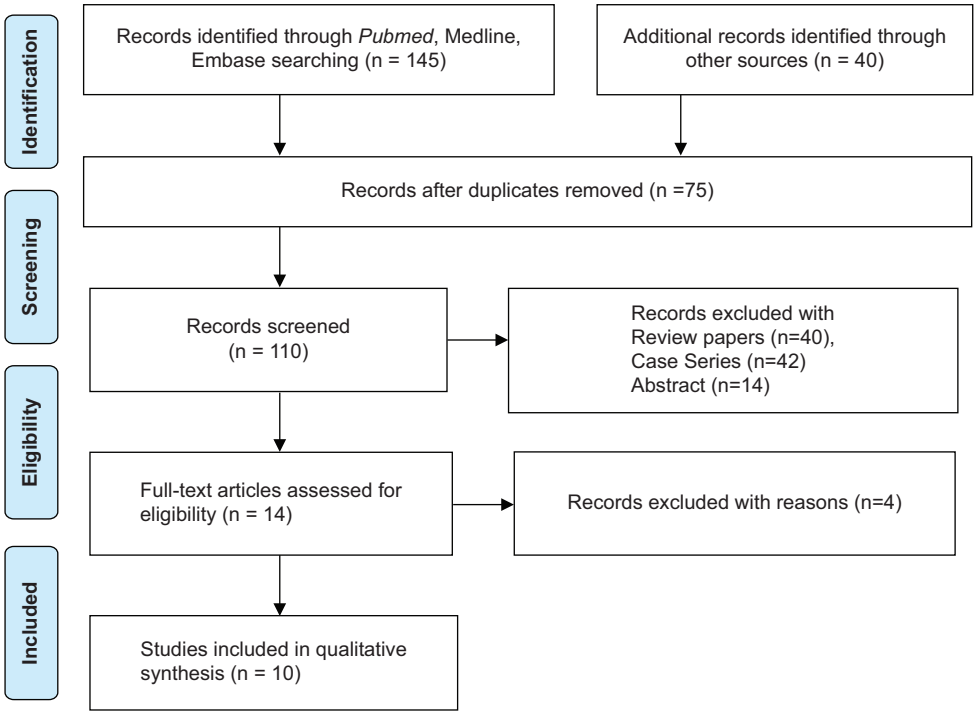

Fig. 1: Preferred Reporting Items for Systematic Reviews and Meta-analysis flow chart

Table 1: Population, Intervention, Comparison , and Outcome Format

S. No.	Category	Search items
1	Population	Patient with neck pain
2	Intervention	Dry needling
3	Comparison	Between cervical range of motion and pain
4	Outcome	Effectiveness of dry needling

Table 2: Study's selection

Initial search	185
Duplicates and non-relevant	75
Case reports and series	42
Reviews	40
Abstract	14

RISK OF BIAS ASSESSMENT

The Cochrane Risk of Bias Assessment Tool was used to evaluate the risk of bias. A judgment of bias (high, low, or uncertain) is made for each factor. Five domains comprise the range of motion: Reporting, attrition, performance, selection, and others. The Quality Assessment Form Part I evaluates the risk of selection, reporting, and other forms of bias. Utilizing the Quality Assessment Form Part II, attrition bias, risk of performance, and detection are evaluated.

For each judgment, the risk of bias was classified as "high," "low," or "unclear" using the instructions at the conclusion of the questionnaire (Table 4).

DISCUSSION

The objective of this systematic review was to provide an overview of the current research on the effectiveness of dry needling for patients with upper trapezius myofascial trigger points. The effects of therapies were described using outcome measures such as pain, range of motion, functioning, and quality of life.

It is critical to point out a few methodological shortcomings of the current systematic review before going into the results. Only the most prevalent characteristics – pain and range of motion – were chosen for attention; however, it might be pertinent to describe additional outcome parameters such as strength and muscle electrical activity.

While there is moderate-to-weak evidence about the effects of dry needling on disability and range of motion, there is high data on its analgesic effects. A 3-week course of dry needling significantly reduced myofascial trigger point discomfort, according to one study. The transition of trigger points from active (painful on its own) to latent or resolved was strongly correlated with a decrease in pain. Gerber found that there was a strong correlation between the reduction of pain and improvements in cervical spine side bending and rotation, as well as improvements in patient self-reports of improved physical and emotional well-being and mood. In addition, there was a reduction in impairment. One dry needling session focused on active myos, according to Abbaszadeh–Amirdehi [28], appears to lessen both the motor endplate's irritation and the sympathetic nervous system's hyperactivity. Deactivating active myofascial trigger points and alleviating symptoms appear to be the two main benefits of dry needling.

According to Agung [30], both groups' pain levels lessened after 4 weeks of treatment. Low-level laser therapy reduced Visual Analog Scale scores more than dry needling did, albeit the difference was not statistically significant. The post-treatment variations in cervical range of motion and pain threshold did not show any meaningful alterations. Patients with myofascial pain syndrome of the upper trapezius muscle responded equally well to low-level laser treatment and dry needling in terms of pain reduction, pain threshold elevation, and cervical range of motion. In addition, compared to dry needling, low-level laser therapy caused greater changes in the range of motion, pain tolerance ratings, and Visual Analog Scale scores. According to Mahdizadeh [34], although upper trapezius trigger point dry needling relieves pain and enhances physical activity, it has no discernible impact on postural control or neck range of motion other than lateral bending in people with chronic neck discomfort.

Performers Golzareh [35] Assessments of the Visual Analog Scale, pain pressure threshold, craniovertebral angle, craniohorizontal angles, range of motion, scapular index, and forward shoulder translation

Table 3: Summary of study's selected

Study	Design of study	Study group	Mean age	Intervention	Outcome	Main Results	References
Gerber *et al*. 2015	A prospective, non-randomized, controlled interventional clinical study	Fifty-six subjects with neck or shoulder girdle pain>3 months duration	Fifty-two completed the study (23 male/33 female) with a mean age of 35.8 years.	Three weekly dry needling treatments of a single active myofascial trigger point	Primary outcomes: 41 subjects had a change in trigger point status from active to latent or resolved; and 11 had no change (p<0.001). Reduction in all pain scores was significant (p<0.001).	Dry needling reduces pain and changes myofascial trigger point status. Change in trigger point status is associated with a statistically and clinically significant reduction in pain. Reduction in pain is associated with improved mood, function, and level of disability.	[26]
Lai *et al*. 2015	Randomized clinical trial	Upper trapezius muscle was randomly divided into three groups: Group 1 (n=20) received dry needling and muscle energy technique, group 2 (n=20) received only muscle energy technique, and group 3 (n=20) received only dry needling.	Sixty female patients, aged 18-30	Dry needling and muscle energy technique	The group receiving trigger point dry needling together with muscle energy technique showed more significant improvement than the other two groups in Visual Analog Scale, pain pressure threshold, and range of motion. No significant differences were found between the muscle energy technique-only group and the dry needling-only group.	Results indicate that all three treatments used in this study were effective for treating myofascial trigger points. According to this study, dry needling and muscle energy techniques are suggested as a new method for the treatment of myofascial trigger points.	[27]
Abbaszadehi *et al*. 2016	Prospective, clinical trial	Study of 20 patients with upper trapezius myofascial trigger points, and 20 healthy volunteers (matched for height, weight, body mass index, and age), all of whom received one session of dry needling.	20 patients (aged 31.7±10.8 years) and 20 matched healthy volunteers (aged 30.4±5.6 years)	Dry Needling	A clinically important reduction in the neuromuscular junction response of patients and an increment in healthy volunteers was demonstrated after dry needling. Pain pressure threshold increased after dry needling in patients, but decreased in healthy volunteers (p<0.0001). Pain intensity improved after dry needling in patients (p<0.001).	The results of this study showed that one session of dry needling targeting active myofascial trigger points appears to reduce hyperactivity of the sympathetic nervous system and irritability of the motor endplate. Dry needling seems effective at improving symptoms and deactivating active myofascial trigger points, although further research is needed.	[28]

(Contd...)

Table 3: ***(Continued)***

Study	Design of study	Study group	Mean age	Intervention	Outcome	Main Results	References
Basak *et al*. 2018	Comparative experimental design	Group A received ischemic compression and muscle energy technique for three sessions for 1 week and group B received dry needling and muscle energy technique for three sessions for 1 week.	Individuals (n=28) aged 18 to 30 years	Ischemic compression and dry needling	Within group analysis revealed significant improvement in either group ($p<0.05$) after 1 week of intervention.	Ischemic compression and dry needling were equally effective in combination with muscle energy technique in the treatment of upper trapezius myofascial trigger points.	[29]
Agung *et al*. 2018	Randomized controlled clinical trial	Thirty-one patients completed the study, 15 received laser therapy, and 16 received dry needling.	Men and women 20–55 years of age	Four weeks of low-level laser therapy three times weekly and dry needling once weekly.	After 4 weeks of therapy, the severity of pain decreased in both groups. The decrease in Visual Analog score was greater with low-level laser therapy than with dry needling, but the difference was not significant.	Low-level laser treatment and dry needling were equally effective in reducing pain and increasing the pain threshold and cervical range of motion in patients with myofascial pain syndrome of the upper trapezius muscle. Changes in Visual Analog scores, pain tolerance values, and range of motion were larger with low-level laser therapy than with dry needling.	[30]
Ziaeifar *et al*. 2019	Randomized controlled trial	Two groups: trigger point compression (n=17) or dry needling (n=16).	The mean age of the trigger point compression group was 26.5±8.57 and for the dry needling group 30.06±9.87	Trigger point compression and dry needling, After 1 week, 2 weeks, and 3 months	The results showed a significant change in pain intensity, neck disability, and disability of the arm, hand, and shoulder after treatment sessions, after 2 weeks and 3 months when compared with before treatment scores in both groups. There was no significant difference in the tested variables after 2 weeks or 3 months as compared to after-treatment sessions between the two groups.	Dry needling and trigger point compression in individuals with myofascial trigger points in the upper trapezius muscle can lead to a 3-month improvement in pain intensity and disability.	[31]

(Contd...)

Table 3: ***(Continued)***

Study	Design of study	Study group	Mean age	Intervention	Outcome	Main Results	References
Navaee *et al*. 2021	A randomized, single-blinded, clinical trial	The upper trapezius muscles were randomly divided into two groups: dry needling with passive stretch (n=15) and passive stretch alone (n=15).	Intervention group with mean age group 25.86±4.17 and control group 26.09±5.17	They received 5 sessions of the intervention for 3 weeks	Significant improvement in pain and pain pressure threshold was observed in both groups (p=0.0001) after the treatment. The results of the independent t-test showed a significant difference in measurements between the dry needling and passive stretch groups (p<0.05).	Dry needling with passive stretching can be more effective on pain and pain pressure threshold than passive stretching alone in the short term in women with non-specific neck pain.	[32]
Emshi *et al*. 2021	Randomized clinical trial	The upper trapezius muscles were randomly divided into three groups: Group 1 (n=30) received dry needling treatment, group 2 (n=26) received soft tissue mobilization treatment, and group 3 (n=25) was considered the control group (no intervention).	aged 18-40 years	Soft-tissue mobilization and dry needling, four sessions.	Both techniques were effective in treating the active trigger point of the upper trapezius (p<0.05), but there was no significant difference between the treatment groups in terms of any of the above variables except for active cervical contra-lateral flexion (p>0.05)	Both soft-tissue mobilization and dry needling were determined to improve numeric pain scale, pain pressure threshold, range of motion, and neck disability index in participants with active trigger points in the upper trapezius, although soft-tissue mobilization was more effective in increasing active cervical contra-lateral flexion in these patients.	[33]
Mahdizadeh *et al*. 2024	Randomized controlled clinical trial.	Thirty individuals were randomly assigned into two groups, (i) 15 receiving interventions (real dry needling), and (ii) 15 in the sham group (sham dry needling).	Aged 18–40 years	Upper trapezius dry needling was applied for three sessions occurring every other day of the week.	No significant differences were seen between the two groups in mean displacement, standard deviation, or maximum velocity in the anterior-posterior and medial-lateral axis and range of motion except for left lateral bending; however, a significant difference was observed between the two groups in pain intensity and neck disability index.	Dry needling on the upper trapezius trigger point does not change postural control but decreases pain and disability.	[34]

(Contd...)

Table 3: *(Continued)*

Study	Design of study	Study group	Mean age	Intervention	Outcome	Main Results	References
Golzareh *et al*. 2024	Quasi-experimental interventional study	Eighteen women with forward head posture underwent a dry needle session	Among 21 to 40 years old, mean age=35.17±5.80	Dry needling for upper trapezius muscle	The results demonstrated that after the intervention, right and left pain pressure threshold, flexion, and proper neck rotation, right and left scapular index, craniovertebral angle, and craniohorizontal angles were significantly improved (p<0.05).	The results showed that one session of dry needling with stretching exercises intervention could improve pain pressure threshold, range of motion, scapular index, craniovertebral angle, and craniohorizontal angles and consequently improve forward head posture.	[35]

Table 4: Risk of bias assessment

Authors name	Selection Bias Random sequence generation	Allocation Concealment	Reporting bias	Others	Performance bias Blinding participants and personnel	Blinding Outcome	Attrition bias	Reference
Gerber *et al*. 2015	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear	High risk	[26]
Lai *et al*. 2015	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	[27]
Abbaszadehi *et al*. 2016	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	[28]
Basak T *et al*. 2018	Low risk	Unclear	Low risk	Low risk	Low risk	Unclear	Low risk	[29]
Agung *et al*. 2018	Low risk	Low risk	Low risk	Low risk	Unclear	Unclear	Low risk	[30]
Ziaeifar *et al*. 2019	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	[31]
Navaee *et al*. 2021	Low risk	Low risk	Unclear	Low risk	Low risk	Unclear	Low risk	[32]
Emshi *et al*. 2021	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	[33]
Mahdizadeh *et al*. 2024	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	[34]
Golzareh *et al*. 2024	Low risk	Low risk	Low risk	Low risk	High risk	Unclear	High risk	[35]

were conducted before and following the dry needling intervention. The findings demonstrated that one session of dry needling therapy combined with stretching exercises was able to improve the aforementioned factors as well as improve forward head posture. Thus, one novel way to improve forward head posture could be to use a dry needle.

There is one study shows similar results done by Emshi [33] that performed the numeric pain scale, pain pressure threshold, active cervical contra-lateral flexion, neck disability index, and muscle thickness, according to rehabilitative ultrasonic imaging, were measured at baseline, immediately after the last session (session 4 in week 2), and 1 month after the last session among three groups: Group 1 (n=30) received dry needling treatment, group 2 (n=26) received instrument-assisted soft-tissue mobilization treatment, and group 3 (n=25) was considered the control group (no intervention) and concluded that both instrument-assisted soft-tissue mobilization and dry needling were determined to improve numeric pain scale, pain pressure threshold, range of motion, and neck disability index in participants with active trigger points in the upper trapezius, although instrument-assisted soft-tissue mobilization was more effective in increasing active cervical contra-lateral flexion in these patients.

Because there could be unfavorable outcomes, the safety of dry needling is now being discussed in the literature. An adverse event was described as "a sequela of medium-term duration with any symptom perceived as unacceptable to the patient and requiring further treatment" by Carlesso *et al*. [36]. According to two earlier studies examining the occurrence of adverse events following dry needling, the most common adverse events were discomfort during/after treatment (5.9%), bruising (7.7%), and bleeding (16%). Each of these incidents was regarded as insignificant [37,38]. Applying dry needling correctly can make it a safe treatment, but there are hazards involved that should be considered for each area of the body that it is given to. Actually, to increase the safety of dry needling treatment, some recent research has suggested adopting alternative locations [39] or using echography [40].

It was occasionally unclear from the description of the dry needling method covered in this systematic review if a local twitch response was intended or produced during the process. To determine if the occurrence of a local twitch response is a reliable indicator of efficacy, more clinical research should report on this.

The number and thickness of needles, the frequency of sessions, and the duration of needle insertion all vary in the different randomized control trials when it comes to the dosage of dry needling. The interpretation of the entire set of results is challenging since, for instance, the frequency of sessions varied from one dry needling session to six sessions spread over a period of 10 weeks. More study is needed to determine the ideal dosage, which is still unknown.

To produce more convincing data, certain other variables require additional exploration in addition to the influence of a local twitch response and the best treatment approaches. To better understand the

long-term consequences of dry needling, more superior randomized control trials are required. Only a small number of studies have examined the long-term consequences of dry needling; the majority of studies have examined the acute effects. More research is required to determine the long-term consequences of dry needling, even though the primary objective is frequently quick pain alleviation so that patients can move on to other types of therapy.

CONCLUSION

Dry needling is recommended for individuals with persistent neck pain at short- and mid-term intervals to enhance pain and functional capacity, according to our systematic review. When it came to the therapies, the analysis of the trials revealed that while dry needling alone did not significantly relieve pain, dry needling in conjunction with physical therapy did show promise in reducing pain. There is substantial proof that dry needling effectively reduces pain. Although similar to other therapeutic approaches, this drop is larger when compared to active range of motion exercises and no placebo intervention. Dry needling appears to have a moderately increased range of motion for side bending, and its effects are comparable to those of lidocaine injection. Weak evidence supports its effects on quality of life and functionality. To produce more conclusive data, more research with superior study designs and suitable comparison treatments is required. In the analysis of the studies, the treatment that showed the greatest functional advantages for pain was dry needling in conjunction with physical therapy.

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