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REVIEW

EFFECTS OF MASSETER MUSCLE DRY NEEDLING ON TEMPORO-MANDIBULAR MYOFASCIAL PAIN: A SCOPING REVIEW

Efectos de la punción seca del músculo masetero sobre el dolor miofascial temporomandibular: una revisión exploratoria

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ABSTRACT

Purpose: Myofascial pain is a common temporomandibular disorder that negatively affects quality of life. This study aims to assess the current evidence on the clinical response of dry needling (DN) applied to the masseter muscle as a therapeutic option for managing temporomandibular myofascial pain.

Material and Methods: A systematic electronic search of the literature was performed in *PubMed, SCOPUS* and *Web of Science* databases using tailored search strategies for each database. Articles published within the last five years were included if they evaluated DN of the masseter muscle in adults with myofascial pain, compared to placebo or other interventions. Pain intensity was assessed using the Visual Analogue Scale (VAS). Methodological quality was evaluated with the Critical Appraisal Skills Programme Spanish (CASPe) checklist for randomized controlled trials. Risk of bias assessment was not performed due to heterogeneity in study designs.

Results: Six studies met the inclusion criteria (four randomized clinical trials, one prospective study, one with unspecified design) involving 243 patients aged 18-65 years. Myofascial pain diagnosis was based on RDC/TMD or DC/TMD criteria. DN produced clinically meaningful reductions in pain intensity, with improvements maintained up to six months in some studies. Functional outcomes such as mouth opening and lateral movements also improved. The comparative efficacy of DN versus other treatments (botulinum toxin- A, platelet-rich plasma, anesthetic nerve blocks) remains inconclusive due to variability in protocols and follow-up.

Conclusions: Dry needling of the masseter muscle shows potential as a therapeutic option for temporomandibular myofascial pain, particularly in reduction and functional improvement. However, heterogeneity across studies and lack of standardized protocols limit definitive conclusions. Further high-quality, standardized research is warranted.

Keywords: *Temporomandibular joint disorders; Masseter muscle; Pain measurement; Masticatory muscles; Physical therapy modalities; Dry needling.*

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RESUMEN

Objetivo: El dolor miofascial es un trastorno temporomandibular frecuente que afecta negativamente la calidad de vida. El objetivo de este estudio es evaluar la evidencia actual sobre la respuesta clínica de la punción seca (PS) aplicada al músculo masetero como opción terapéutica para el manejo del dolor miofascial temporomandibular.

Materiales y métodos: Se realizó una búsqueda electrónica sistemática de la literatura en las bases de datos PubMed, Scopus y Web of Science, utilizando estrategias de búsqueda específicas para cada una. Se incluyeron artículos publicados en los últimos cinco años que evaluaran la PS del músculo masetero en adultos con dolor miofascial, en comparación con placebo u otras intervenciones. La intensidad del dolor se evaluó mediante la Escala Visual Analógica (EVA). La calidad metodológica se valoró mediante la lista de verificación del Critical Appraisal Skills Programme en su versión española (CASPe) para ensayos clínicos aleatorizados. No se realizó evaluación del riesgo de sesgo debido a la heterogeneidad de los diseños de los estudios.

Resultados: Seis estudios cumplieron los criterios de inclusión (cuatro ensayos clínicos aleatorizados, un estudio prospectivo y uno con diseño no especificado), que incluyeron un total de 243 pacientes de entre 18 y 65 años. El diagnóstico de dolor miofascial se basó en los criterios RDC/TMD o DC/TMD. La PS produjo reducciones clínicamente significativas en la intensidad del dolor, con mejoras que se mantuvieron hasta seis meses en algunos estudios. Asimismo, se observaron mejoras en los resultados funcionales, como la apertura bucal y los movimientos laterales. La eficacia comparativa de la PS frente a otros tratamientos (toxina botulínica tipo A, plasma rico en plaquetas, bloqueos nerviosos anestésicos) sigue siendo inconclusa debido a la variabilidad en los protocolos y en los períodos de seguimiento.

Conclusión: La punción seca del músculo masetero muestra potencial como opción terapéutica para el dolor miofascial temporomandibular, particularmente en la reducción del dolor y la mejora funcional. No obstante, la heterogeneidad entre los estudios y la falta de protocolos estandarizados limitan la obtención de conclusiones definitivas. Se requieren futuras investigaciones de alta calidad y con metodologías estandarizadas.

Palabras clave: *Trastornos de la articulación temporomandibular; Músculo masetero; Dimensión del dolor; Músculos masticadores; Modalidades de fisioterapia; Punción seca.*

INTRODUCTION

General background

Myofascial pain, described by Travell and Simons, is a non-inflammatory regional muscle condition characterized by hypersensitive trigger points -palpable nodules - within taut bands of skeletal muscle. These trigger points may elicit pain during compression, contraction, or stretching. Both central and peripheral sensitization mechanisms are involved, with peripheral sensitization likely playing a predominant role.[1]

Etiology

Myofascial pain multiple interacting factors including anatomical variations, pathophysiological mechanisms, psychosocial stressors, and trauma. These can perpetuate muscle overload, leading to reduced ATP and oxygenation, and increased nociceptor activation.[1] Demographically, prevalence varies, potentially affecting up to 80-90% of the general population and is more frequently observed in women.[2]

Pathology in the temporomandibular region

At the temporomandibular level, myofas-

cial pain is classified as a subtype of myalgia under Axis I of the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) classification.[3,4] Myofascial pain is characterized by both examination and the clinical history. Clinically, it manifests as localized or radiating jaw, ear, or temporal pain. In terms of clinical history, the patient reports jaw pain, ear pain or pain in the temporal or masseter muscle that radiates beyond the palpation site but within the limits of the palpated muscle which is called myofascial pain without referral, while myofascial pain with referral refers to pain extending beyond the limits of the palpated muscle.[4]

In contrast to the DC/TMD, its predecessor, the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD), classifies myofascial pain as with or without limited opening. Myofascial pain with limited opening is described as a mandibular opening of 40 mm or less without assistance and without pain, or a maximum passive opening that is 5 mm greater than the pain-free, unassisted opening.[4] Studies indicate that it is more common among individuals aged 27 to 50, with no significant differences between genders.[5]

However, a study conducted in Temuco, Chile, suggests that the prevalence of temporomandibular myofascial pain is not associated with age but rather with gender, being more common in women (80.6%) than in men (19.39%).[6] Regarding its location, the masseter muscle is the most affected, followed by the temporalis and upper trapezius muscles.[6]

Pain has a negative impact on quality of life, as revealed by assessments using the Short-Form Health Status Questionnaire (SF-36) and the Nottingham Health Profile (NHP).[7,8] Although temporomandibular disorders are not always painful, they are one of the main causes of non-dental pain in the orofacial region, directly affecting patient's quality of life.[9]

Management modalities

Management includes multimodal approaches such as patient education, pharmacotherapy, behavioral strategies, and physical therapies (e.g., laser, ultrasound, exercises). Needling techniques - both wet and dry- are among the proposed options.[10-13]

Limitations of conventional pharmacological options

Pharmacological interventions, while useful for acute symptom relief, may carry systemic side effects, fail to address underlying muscular dysfunction, and have limited evidence for sustained benefit.[14]

Innovations and study rationale

Dry needling (DN) is minimally invasive, targeting trigger points to elicit local twitch responses and potentially reducing inflammatory mediators, and it has been widely investigated in other muscle groups, but evidence for its efficacy in the masseter remains inconsistent.[15] Althought the mechanisms underlying DN remain incompletely understood, it has been suggested that the insertion of a needle into the trigger point causes a localized contraction which generates an analgesic effect. This pain relief might be due to the reduction of concentrations of substances such as substance P, cytokines and CGRP. Despite being an old technique, there remains some uncertainty about the clinical response in the masseter muscle.[16,17]

Given the prevalence of temporomandibular myofascial pain and its impact on quality of life, as well as the lack of clarity regarding the clinical response of dry needling in the

masseter muscle, it is crucial to evaluate its use in this condition. This review aims to address these gaps by synthesizing the recent evidence, assessing clinical outcomes specific to masseter DN, and identifying research priorities

MATERIALS AND METHODS

Protocol

This scoping review was conducted following the PRISMA guidelines for Scoping Reviews (PRISMA-ScR) from Equator Network. The study was performed by three independent reviewers (RB, CL, GO).

The research question was: What is the therapeutic response of dry needling in the masseter muscle in the management of temporomandibular myofascial pain?

Information sources and search strategy

A systematic search was conducted in the PubMed, SCOPUS and Web Of Science (WOS) databases on December 5, 2023. Controlled vocabulary and free-text terms were adapted to each database. Although gray literature databases were not researched, the three selected databases were considered sufficient to provide a broad and representative coverage of peer-reviewed evidence on this topic. This decision aimed to ensure methodological rigor and feasibility, but we acknowledge it may limit sensitivity. The complete strategies are presented in Table 1, Table 2 and Table 3.

Eligibility criteria

Studies published within the last five years from the search date (December 5, 2023) that evaluated dry needling of the masseter muscle in adult patients (>18 years) with myofascial pain. Eligible studies compared DN with placebo or alternative interventions (e.g., local anesthetics, platelet-rich plasma, botulinum toxin). Articles had to be available in English with full text accessible. Reviews, systematic reviews, and meta-analyses were excluded, as well as duplicated and studies that combine dry needling of the masseter muscle with interventions in other masticatory muscle without separate analysis.

Data extraction and synthesis

Data extraction was performed using a standardized Microsoft Excel template. Extracted information included for each article: the author and year of publication, the study design, the number of patients with myofascial pain, the age of the participants and the country were recorded. The description of the intervention, the dependent variables, the data collection method and the diagnostic criteria used were specifically detailed, the outcomes assessed and follow-up periods. Functional measures such as mouth opening and lateral/protrusive movements were also collected.

Quality appraisal

Articles were assessed with the Critical Appraisal Skills Programme (CASP) Randomized Controlled Trial Checklist, this tool contains 11 items that score 0-2 points, with Articles were assessed using the Critical Appraisal Skills Programme (CASP) Randomized Controlled Trial Checklist. This tool contains 11 items scored from 0 to 2 points, with total scores ranging from 0 (low quality) to 22 (high quality).[18] Studies were classified as high quality (22 points), moderate quality (16–21 points), or low quality (<15 points).

RESULTS

Study selection

The initial search identified 529 articles across *PubMed*, *Scopus* and *Web of Science*. After duplicate removal (n=41) using the Ray-

Figure 1
PRISMA-ScR flowchart of the study selection process

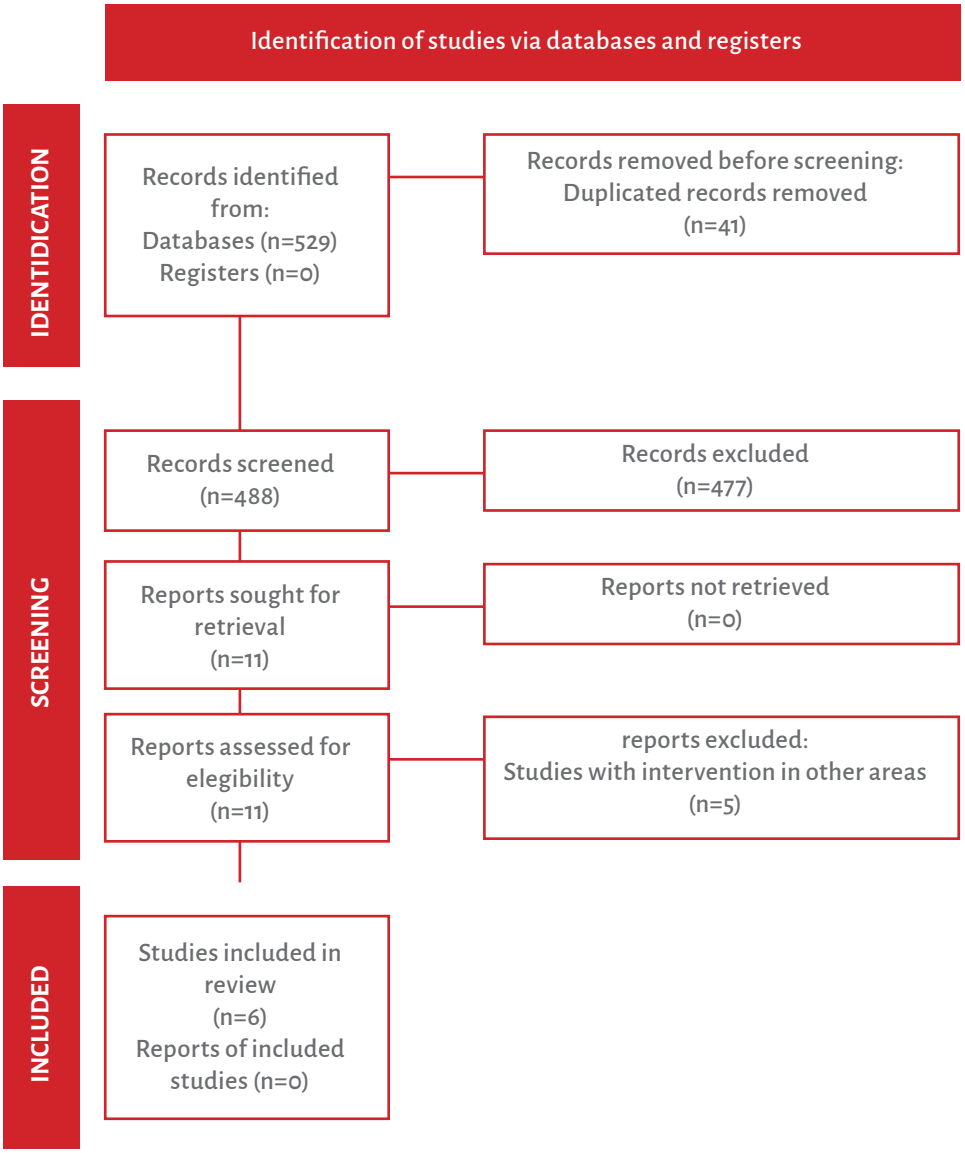
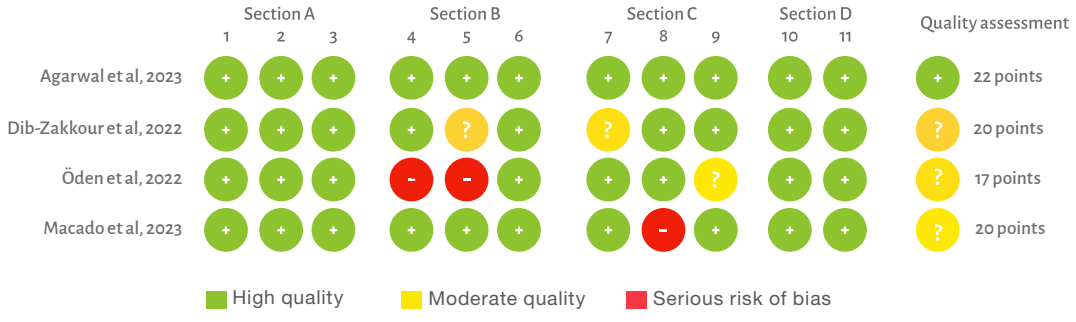


Figure 2
Critical appraisal within sources of evidence



yan platform, 488 unique records remained for screening. Based on title and abstract review, 477 articles were excluded, leaving 11 for full-text assessment. Of these, 5 were excluded for not meeting inclusion criteria, resulting in 6 studies included in the review. The selection process is summarized in the PRISMA-ScR flowchart (Figure 1).

Characteristics of included studies

Four randomized controlled trials (RCTs), one prospective cohort and one study without a specified design were included, with a total of 243 patients, aged 18-65 years, all diagnosed with myofascial pain. Diagnostic criteria varied: two studies used RDC/TMD,[19–21] three studies used DC/TMD (with one restricted to pain with referral), and one applied only clinical criteria.[22] Given these differences, results are reported collectively as myofascial pain according to RDC/TMD or DC/TMD, without subclassification (Table 4).

Critical Appraisal

Of the six selected articles only four were randomized clinical trials. The methodological quality of these four studies was assessed with the (CASP) Randomized Controlled Trial Checklist".[18] The two non-randomized studies were not formally appraised with CASP, but their methodological features (study design, diagnostic criteria, outcome measures) were described narratively to provide context, highlighting limitations in design and outcome reporting. Overall, quality ranged from moderate to high (Figure 2).

Risk of bias

A formal risk of bias assessment was not conducted because of heterogeneity in study design (RCTs, prospective studies, non-randomized interventions). Applying a single standardized tool would not have been appropriate. Instead, a qualitative appraisal of design strengths and weaknesses was performed. This limitation is acknowledged in the discussion.

Follow-up periods

Follow-up duration varied considerably: Two studies measured outcomes immediately after intervention,[19,23] one study extended follow-up to six months.[24] The remaining studies assessed outcomes at intervals between 3 and 12 weeks.[19,20,22,25] These differences in follow-up likely influenced the observed consistency of treatment effects. Longer-term outcomes remain insufficiently documented (Table 5).

Pain outcomes

All six studies assessed pain intensity using the Visual Analogue Scale (VAS). Some also incorporated algometry for pressure pain threshold:[19,20]

Pre- and post-treatment values: Dib-Zakkour *et al.*,[19] reported that at baseline 73.3% of patients presented with moderate pain, while after six months 60% reported only mild pain, reflecting clinically significant improvement. Similarly, Agarwal *et al.*,[24] found that VAS scores decreased consistently from baseline through 2 weeks, 1 month, 3 months, and 6 months post-intervention, with both DN and platelet-rich plasma groups improving. Immediate *versus* delayed effects: In Dib-Zakkour *et al.*,[19] and Macedo *et al.*,[23] sinificant VAS reductions were observed immediately after DN compared to sham interventions.[24]

Superficial *versus*. deep DN: Özden *et al.*,[20] reported greater short-term pain reduction with superficial DN compared to deep DN. However, by six weeks, differences between techniques were not statistically significant.

Comparisons with other interventions: Taşkesen *et al.*,[25] observed that DN and masseteric nerve block both produced significant

Table 1

Search strategy used in PubMed

No of search	Search strategy	Results
#1	"masseter muscle" [MeSH Terms] OR ("masseter"[All Fields] AND "muscle"[All Fields]) OR "masseter muscle"[All Fields] OR ("masseter muscle"[MeSH Terms] OR ("masseter"[All Fields] AND "muscle"[All Fields]) OR "masseter muscle"[All Fields] OR ("masseter"[All Fields] AND "muscles"[All Fields]) OR "masseter muscles"[All Fields]) OR (("chewings"[All Fields] OR "chews" [All Fields] OR "mastication"[MeSH Terms] OR "mastication"[All Fields] OR "chewed"[All Fields] OR "chewing"[All Fields]) AND ("muscles" [All Fields] OR "muscles" [MeSH Terms] OR "muscles" [All Fields] OR "muscle"[All Fields])) OR (("chewings"[All Fields] OR "chews" [All Fields] OR "mastication"[MeSH Terms] OR "mastication" [All Fields] OR "chewed"[All Fields] OR "chewing" [All Fields]) AND ("muscle s" [All Fields] OR "muscles" [MeSH Terms] OR "muscles" [All Fields] OR "muscle"[All Fields])) OR ("masticatory muscles" [MeSH Terms] OR ("masticatory" [All Fields] AND "muscles"[All Fields]) OR "masticatory muscles"[All Fields])	18,602
#2	"acupunctural"[All Fields] OR "acupuncture"[MeSH Terms] OR "acupuncture" [All Fields] OR "acupuncture therapy" [MeSH Terms] OR ("acupuncture"[All Fields] AND "therapy" [All Fields]) OR "acupuncture therapy"[All Fields] OR "acupuncture s"[All Fields] OR "acupunctured"[All Fields] OR "acupunctures"[All Fields] OR "acupuncturing"[All Fields] OR ("dry needling"[MeSH Terms] OR ("dry" [All Fields] AND "needling"[All Fields]) OR "dry needling"[All Fields])	43,948
#3	("myofascial"[All Fields] AND ("pain"[MeSH Terms] OR "pain" [All Fields])) OR ("temporomandibular joint disorders"[MeSH Terms] OR ("temporomandibular"[All Fields] AND "joint"[All Fields] AND "disorders" [All Fields]) OR "temporomandibular joint disorders" [All Fields] OR ("temporomandibular"[All Fields] AND "disorder" [All Fields]) OR "temporomandibular disorder"[All Fields]) OR ("temporomandibular joint disorders"[MeSH Terms] OR ("temporomandibular"[All Fields] AND "joint"[All Fields] AND "disorders" [All Fields]) OR "temporomandibular joint disorders"[All Fields] OR ("temporomandibular" [All Fields] AND "disorders"[All Fields]) OR "temporomandibular disorders"[All Fields])	26,314
#4	((#1) AND (#2)) AND (#3)	63

Table 2

Search strategy used in Scopus

No of search	Search strategy	Results
#1	(ALL ("masseter" AND "muscle") OR ALL ("masseter" AND "muscles") OR ALL ("chewing" AND "muscle") OR ALL ("chewing" AND "muscles") OR ALL ("masticatory" AND "muscles"))	50,152
#2	(ALL ("acupuncture") OR ALL ("dry" AND "needling"))	122,461
#3	(ALL ("myofascial" AND "pain") OR ALL ("temporomandibular" AND "disorder") OR ALL ("temporomandibular" AND "disorders"))	
#4	((ALL ("masseter" AND "muscle") OR ALL ("masseter" AND "muscles") OR ALL ("chewing" AND "muscle") OR ALL ("chewing" AND "muscles") OR ALL ("masticatory" AND "muscles"))) AND ((ALL (acupuncture") OR ALL ("dry" AND "needling"))) AND ((ALL ("myofascial" AND "pain ") OR ALL ("temporomandibular" AND "disorder") OR ALL ("temporomandibular" AND "disorders")))	72,654
#1 AND #2 AND #3	((ALL ("masseter" AND "muscle") OR ALL ("masseter" AND "muscles") OR ALL ("chewing" AND "muscle") OR ALL ("chewing" AND "muscles") OR ALL ("masticatory" AND "muscles"))) AND ((ALL ("acupuncture") OR ALL (dry AND "needling"))) AND ((ALL ("myofascial" AND "pain") OR ALL ("temporomandibular" AND "disorder") OR ALL ("temporomandibular" AND "disorders")))	1,197
#1 AND #2 AND #3	((ALL ("masseter" AND "muscle") OR ALL ("masseter" AND "muscles") OR ALL ("chewing" AND "muscle") OR ALL ("chewing" AND "muscles") OR ALL ("masticatory" AND "muscles"))) AND ((ALL "acupuncture") OR ALL ("dry" AND "needling"))) AND ((ALL ("myofascial" AND "pain") OR ALL ("temporomandibular" AND "disorder") OR ALL ("temporomandibular" AND "disorders"))) Filtered: Years	486

Table 3

Search strategy used in Web of Science (WOS)

No of search	Search strategy	Results
#1	"masseter muscle" (All Fields) or "masseter muscles" (All Fields) or "chewing muscle" (All Fields) or "chewing muscles" (All Fields) or "masticatory muscles" (All Fields)	10,662
#2	"acupuncture" (All Fields) or "dry needling" (All Fields)	37,733
#3	"myofascial pain" (All Fields) or "temporomandibular disorder" (All Fields) or "temporomandibular disorders" (All Fields)	15,158
#1 AND #2 AND #3	#3 AND #2 AND #1	55
#1 AND #2 AND #3	#3 AND #2 AND #1 and 2019 or 2020 or 2021 or 2022 or 2023 (Publication Years)	29

Table 4

Main characteristics of the selected studies

Pain measurement/ assessment	VAS (0–10)	VAS and pressure algometer	VAS and pressure algometer	VAS (0–10) and Likert Scale	VAS (0–10)	VAS
Diagnostic criteria of Myofascial pain	DC/TMD	RDC/TMD	RDC/TMD	DC/TMD	Clinical findings	DC/TMD
Age (in years)	Mean of age: Test group: 40.40; control group: 32.60	18–40	18–65	18–54	20–60	18–37
Gender	Female: 6 Male: 24	NR	Female: 24 Male: 16	Female: 39 Male: 6	Female: 29 Male: 11	Female: 24 Male: 8
No. of temporomandibular MFP patients	30	36	40	45	40	32
Study design	RCT	Double blind RCT	RCT	NR (non-randomized controlled trial)	Prospective study	Double blind, crossover RCT
Reference	Agarwal, et al., 2022.	Dib-Zakkour, et al., 2022.	Özden, et al., 2018.	Taşkesen, et al., 2020.	Kütük, et al., 2019.	Macedo, et al., 2023.

DC/TMD: Diagnostic Criteria for Temporomandibular Disorders. **NR:** Not reported. **RCT:** Randomized clinical trial. **RDC/TMD:** Research Diagnostic Criteria for Temporomandibular Disorders. **VAS:** Visual Analog Scale.

reductions in pain during function, with no differences between groups. Kütük *et al.*,[22] reported that both DN and botulinum toxin-A improved resting and chewing-related pain, though relative efficacy remained inconclusive due to protocol variability.
Overall, DN demonstrated a consistent trend toward pain reduction across studies, with improvements maintained for up to six months in some cases.

Functional movement ranges outcomes

Three studies evaluated mandibular function. Dib-Zakkour *et al.*,[19] reported an increase in mean maximum mouth opening from 45 mm at baseline to 51 mm post-treatment. Taşkesen *et al.*,[25] found significant short-term improvements in pain-free maximum mouth opening across DN, local anesthetic, and nerve block groups, with no differences between interventions. Kütük *et al.*,[22]. observed significant improvements in lateral mandibular movements in DN compared to botulinum toxin-A after six weeks.

DISCUSSION

Pain in the orofacial region represents a significant challenge in clinical practice and public health. This review synthesized the available evidence on the therapeutic response of dry needling (DN) applied to the masseter muscle in patients with temporomandibular myofascial pain.

Main findings

Across the six included studies, DN consistently demonstrated a reduction in pain intensity measured by VAS, with improvements sustained up to six months in some cases.[19,24] Functional outcomes, including increased maximum mouth opening and lateral movements, were also reported.[26] These findings suggest that DN has potential as a therapeutic option for temporomandibular myofascial pain, particularly for short- to mid-term symptom relief.[27-29]

Comparison with placebo and technique variations

When compared to sham interventions, DN produced greater reductions in pain, supporting its efficacy beyond placebo effects.[19,21] Both superficial and deep DN techniques improved symptoms, although no consistent differences were identified between them in medium-term follow-up.[20,30] These results are congruent with systematic reviews on other muscle groups,[27–29] which similarly report comparable outcomes between superficial and deep approaches.[31-33]

Comparison with alternative therapies

The comparative efficacy of DN *versus* other interventions remains less conclusive. DN showed similar pain reductions when compared to masseteric nerve block and local anesthetic trigger point injections.[25,34]
Likewise, DN and platelet-rich plasma demonstrated comparable effects,[24] although meta-analyses suggest PRP may offer superior short-term outcomes.[16] In contrast, comparisons with botulinum toxin-A yielded mixed results: some studies favored DN,[22] while others reported no significant differences.[35] This variability highlights the need for standardized protocols and longer follow-up to determine relative efficacy.

Critical appraisal of evidence

The methodological quality of the RCTs included ranged from moderate to high, while the two non-randomized studies provided weaker evidence. Diagnostic criteria varied (RDC/TMD *versus* DC/TMD *versus* clinical), and follow-up times were inconsistent, limiting comparability with other previous

reviews.[20,27-30,32] Overall, these studies suggest that dry needling treatment of the masseter muscle is successful in reducing myofascial pain, maintaining its effect after various weeks of follow-up.[19,20,22-25]

Adverse effects and safety considerations

While DN is generally safe, transient adverse effects were reported, most commonly post-needling soreness, temporary pain exacerbation, and localized hematomas or minor bleeding. These effects usually resolved within 72 hours.[23] Factors such as needle depth, gauge, number of insertions, and operator technique may influence the occurrence of adverse events.[26] Importantly, no severe complications were reported in the included studies.[36] Nevertheless, the current literature does not allow firm conclusions regarding safety,[37] partly due to the lack of standardized reporting of adverse events.[38]

Previous studies have evaluated post-puncture pain after the application of physical therapies in order to treat this adverse effect.[38] One study even suggests the application of simultaneous local anesthetic to reduce post-puncture pain.[26] The heterogeneity of the available studies and and the limited reporting of post-puncture pain post-puncture pain makes it difficult to understand. Finally, the presence of hematomas has been reported in 7.55% and bleeding in 4.65%.[36]

Some contraindications for its use have been described, including patients with needle phobia, local or systemic infections, localized edema and patients with a compromised immune system, among others.[39] However, it should be considered that dry needling improves the quality of life when measured through SF-36 after its execution[28] and even in its components such as physical and social function, general health and quality of sleep.[40]

Clinical and public health relevance

The results of this review suggest that DN can reduce pain and improve function in patients with temporomandibular myofascial pain.[37] In clinical practice, DN may be considered as part of multimodal management, particularly when pharmacological therapies are insufficient or contraindicated. From a public health perspective, wider adoption of DN could reduce reliance on systemic medications, thereby lowering the burden of side effects and improving quality of life.[41,42] Nevertheless, the absence of standardized protocols and the variability of outcomes call for cautious implementation and highlight the importance of interdisciplinary care that incorporates biopsychosocial factors (Axis II).

Limitations of this review

This scoping review had some limitations that must be acknowledged: first, only six studies were included, with relatively small sample sizes. Second, the heterogeneity of diagnostic criteria, treatment protocols, and outcome measures limits comparability. Third, the absence of a formal risk of bias assessment reduces the certainty of conclusions, which further constrains the interpretation of comparative efficacy. Fourth, the search was restricted to three databases and English-language publications, which may have excluded relevant studies. Finally, the lack of clear diagnostic criteria through recognized guidelines such as DC/TMD and standardization of the technique are other aspects that should be improved for future studies. Therefore, although the studies included in this scoping review are of a moderate to high quality according to CASP guidelines,[18] they should be reviewed with caution. These limitations must be considered when interpreting the findings.

Future directions

Further research is required to: Conduct well-powered RCTs with standardized DN protocols, incorporate longer-term follow-up to assess durability of treatment effects, compare DN with other commonly used interventions (e.g., PRP, botulinum toxin-A, local anesthetics) using uniform outcome measures, evaluate the influence of psychosocial factors and integrate Axis II assessments into study designs and improve reporting of adverse effects to better define the safety profile of DN.

Strengths of this review

This review focuses specifically on the application of DN to the masseter muscle, synthesizing recent evidence published in the last five years. By restricting inclusion to this muscle, the review provides a more targeted evaluation of DN in temporomandibular myofascial pain compared to prior reviews with broader scopes. The systematic approach, adherence to PRISMA-ScR guidelines, and independent review process strengthen its methodological rigor.

CONCLUSIONS

Current evidence suggests potential benefit in dry needling of the masseter muscle as an option for temporomandibular myofascial pain., with evidence supporting reductions in pain intensity and improvements in function.

However, conclusions regarding comparative efficacy are limited by heterogeneity of study designs and the absence of risk of bias analysis. DN may serve as a useful component of multimodal therapy, but further high-quality, standardized studies are necessary to establish its role in clinical protocols and public health recommendations.

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