

Effects of Auriculotherapy on Temporomandibular Disorder in the sports context: a narrative review

Efeitos da Auriculoterapia na Disfunção Temporomandibular no âmbito esportivo: uma revisão narrativa

Efectos de la auriculoterapia en la función temporomandibular en el ámbito deportivo: una revisión narrativa

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ABSTRACT. Objective: this narrative review aimed to synthesize and analyze the current scientific evidence on the use of auriculotherapy for managing Temporomandibular Disorder (TMD) in athletes. **Methods:** a comprehensive search was conducted in the PubMed and SciELO databases between February and April 2024, including studies published from 2019 to 2024. **Results:** a total of 910 articles were identified, of which 9 met the inclusion criteria and were included in the final analysis. **Conclusion:** the findings suggest that auriculotherapy and auricular acupuncture have beneficial effects in relieving pain, improving quality of life, and reducing pre-competition anxiety in athletes, representing a promising complementary strategy for the management of TMD in the sports context.

Descriptors: Temporomandibular Joint Disorders; Auriculotherapy; Athletes.

RESUMO. Objetivo: esta revisão narrativa teve como objetivo sintetizar e analisar as evidências científicas atuais sobre o uso da auriculoterapia no manejo das disfunções temporomandibulares (DTM) em atletas. **Métodos:** foi realizada uma busca abrangente nas bases de dados PubMed e SciELO entre fevereiro e abril de 2024, incluindo estudos publicados no período de 2019 a 2024. **Resultados:** foram identificados 910 artigos, dos quais 9 atenderam aos critérios de inclusão e foram incluídos na análise final. **Conclusão:** os achados sugerem que a auriculoterapia e a acupuntura auricular apresentam efeitos benéficos no alívio da dor, na melhora da qualidade de vida e na redução da ansiedade pré-competição em atletas, representando uma estratégia complementar promissora para o manejo da DTM no contexto esportivo.

Descritores: Disfunções da Articulação Temporomandibular; Auriculoterapia; Atletas.

RESUMEN. Objetivo: esta revisión narrativa tuvo como objetivo sintetizar y analizar la evidencia científica actual sobre el uso de la auriculoterapia en el manejo de los trastornos temporomandibulares (TTM) en atletas. **Métodos:** se realizó una búsqueda exhaustiva en las bases de datos PubMed y SciELO entre febrero y abril de 2024, incluyendo estudios publicados en el periodo de 2019 a 2024. **Resultados:** se identificaron 910 artículos, de los cuales 9 cumplieron con los criterios de inclusión y fueron incluidos en el análisis final. **Conclusión:** los hallazgos sugieren que la auriculoterapia y la acupuntura auricular presentan efectos beneficiosos en el alivio del dolor, en la mejora de la calidad de vida y en la reducción de la ansiedad precompetitiva en atletas, representando una estrategia complementaria prometedora para el manejo de los TTM en el contexto deportivo.

Descritores: Trastornos de la Articulación Temporomandibular; Auriculoterapia; Atletas.

INTRODUCTION

High-performance athletes are particularly susceptible to developing temporomandibular disorders (TMD) due to continuous exposure to physical and psychological stressors, including exhaustive training, pre-competition anxiety, and performance-related pressure. These factors may contribute to musculoskeletal alterations in the temporomandibular joint (TMJ) and associated structures, potentially compromising athletic performance^(1,2).

TMD refers to a group of conditions affecting the masticatory muscles, TMJ, and related anatomical components. It is clinically characterized by facial pain, restricted mandibular movement, joint sounds, headaches, and myofascial trigger points, particularly in the masseter, temporalis, and sternocleidomastoid muscles^(3,4). The prevalence of TMD is notably higher among athletes, especially those involved in contact sports, where direct or indirect trauma to the jaw is common. In addition to biomechanical factors, psychosomatic elements play a significant role in the onset and exacerbation of the disorder⁽⁵⁾.

In this context, non-invasive interventions are increasingly favored over surgical procedures, which entail higher risks and may result in irreversible anatomical alterations. Among conservative approaches, physical therapy, dental management, self-care strategies, and, more recently, integrative and complementary practices such as auriculotherapy have gained substantial attention^(4,6).

Auriculotherapy, developed by Paul Nogier, involves stimulating specific auricular points to produce analgesic effects and modulate the autonomic nervous system. Evidence suggests its effectiveness in managing musculoskeletal pain conditions—including headaches, TMJ dysfunction, anxiety, and fatigue—as well as its positive influence on physiological parameters such as heart rate, cortisol levels, and aerobic capacity in athletes⁽⁷⁻⁹⁾.

This technique is safe, cost-effective, and easy to apply, with potential for outpatient, field-side, and continuous use in athletic settings. Considering the growing demand for non-invasive, integrative solutions for TMD in sports, this study aims to synthesize and analyze the current scientific evidence regarding the effects of auriculotherapy on TMD in athletes.

METHODS

This study is a narrative literature review based on the analysis of previously published scientific articles available in indexed databases. The research question was structured using the PICO strategy to guide the selection and interpretation of relevant studies.

The formulated research question was: “What scientific evidence is available regarding the effects (Outcome) of auriculotherapy or auricular acupuncture (Intervention) in athletes (Population) with temporomandibular disorder, compared to no treatment or conventional therapies (Control)?”

The methodological process followed six main steps: (1) definition of the research topic and guiding question; (2) selection of controlled descriptors in Portuguese and English using the Health Sciences Descriptors (DeCS) and the corresponding Medical Subject Headings (MeSH); (3) literature search in the electronic databases PubMed and SciELO; (4) application of eligibility criteria; (5) data extraction and organization using Microsoft Excel 2016; and (6) critical reading and qualitative analysis of the included studies.

To ensure a comprehensive and accurate search strategy, DeCS descriptors in Portuguese were combined with MeSH terms in English. The descriptors used in Portuguese were: "Auriculoterapia", "Acupuntura na Orelha", "Disfunção Temporomandibular", "Temporomandibular", "Músculos da Mastigação", "Acupressão", and "Atletas". The corresponding MeSH terms were: "Auriculotherapy", "Acupuncture, Ear", "Temporomandibular Joint Dysfunction Syndrome", "Temporomandibular Joint", "Masticatory Muscles", "Acupressure", and "Athletes".

The literature search was conducted between February and April 2024. Eligible studies were full-text articles published between 2019 and 2024, in Portuguese, English, or Spanish, regardless of study design, provided they were indexed in scientific journals. Articles that were duplicates or did not provide full-text access were excluded.

Study selection was carried out independently by two reviewers. Initially, titles and abstracts were screened, followed by full-text reading of potentially eligible studies. Any disagreements were resolved by consensus between the reviewers. Data extraction and qualitative analysis were completed in May 2024.

RESULTS

The search for studies published between February and May 2024 yielded 910 articles, 814 from the PubMed database and 96 from SciELO. After title screening to identify duplicates and applying the predefined inclusion and exclusion criteria, nine articles were included in this review, as presented in Table 1.

Table 1. Articles Included in the Review on Auriculotherapy for TMD in Athletes from 2019 to 2024.

Author/Year	Article title	Conclusion
ROCA et al., 2022.	Auricular acupuncture in TMD - A sham-controlled, randomized, clinical trial	Auriculotherapy applied to the TMJ point, focusing on the treatment of TMD, showed improvements in pain in the masticatory muscles, joint pain, intraoral pain, and mouth opening in patients with TMD.

LI et al., 2021.	The effect of health-care Qigong Baduanjin combined with auricular point sticking on athletes' pre-competition anxiety: A protocol for systematic review and meta-analysis	Long-term training in Baduanjin Qigong (HCQB), combined with auriculotherapy, exerts anxiolytic and calming effects, which may enhance self-control, relieve mental fatigue, regulate mood, and help maintain physical and psychological balance.
NIELSEN, A.; GEREAU, S.; TICK, H., 2020	Risks and Safety of Extended Auricular Therapy: A Review of Reviews and Case Reports of Adverse Events	Extended auriculotherapy using seeds provides clinical benefits without the risk of adverse events caused by contaminated piercing or cutting materials.
NOLL et al., 2020.	Influence of auriculotherapy on athletic performance and sports: review and perspectives	Auricular stimulation in athletes showed positive results in maximal oxygen uptake, significantly reduced heart rate and blood lactate levels, improving post-exercise recovery.
REIS et al., 2021.	Effect of Auricular Acupuncture on the Reduction of Symptoms Related to Sleep Disorders, Anxiety, and Temporomandibular Disorder (TMD)	Auricular acupuncture was effective in reducing symptoms of sleep disorders, anxiety, and TMD dysfunctions.
RODRIGUES et al., 2019.	Effects of low-power laser auriculotherapy on the physical and emotional aspects in patients with temporomandibular disorders: A blind, randomized, controlled clinical trial	Stimulation of auricular acupoints promoted pain relief in the TMJ on both sides and improved mandibular biomechanics (function) and emotional aspects.
SERRITELLA et al., 2021.	Auriculotherapy used to manage orthodontic pain: a randomized	As a complementary treatment, Auriculotherapy is a valid analgesic alternative for managing orthodontic pain.

	controlled pilot study.	
SIMMA, I.; SIMMA, L.; FLECKENSTEIN, J. 2018.	Muscular diagnostics and the feasibility of microsystem acupuncture as a potential adjunct in the treatment of painful temporomandibular disorders: results of a retrospective cohort study	The treatment of TMD with microsystem acupuncture proved effective, resulting in immediate relief in TMJ pain intensity.
VIEIRA et al., 2022.	The Effect of Auriculotherapy on Situational Anxiety Triggered by Examinations: A Randomized Pilot Trial	Auriculotherapy has an immediate and short-term effect in reducing anxiety and improving sleep quality in students.

Fonte: the authors.

DISCUSSION

Integrative and complementary therapies have become adjunctive resources to conventional treatments in various musculoskeletal conditions. Among these practices, auriculotherapy has emerged as a promising alternative in managing pain associated with TMD, especially in cases with functional or psychosomatic etiology, such as orthodontic treatments or athletic settings⁽¹⁰⁾.

Studies such as Aroca et al.⁽⁸⁾ demonstrated that auriculotherapy applied to a specific point for TMD significantly improved patient pain symptoms. This analgesic effect is attributed to the activation of neurophysiological mechanisms related to endogenous pain modulation, including the release of natural opioids and inhibition of nociceptive transmission at the spinal level, as also described by Artioli, Tavares, and Bertolini⁽¹¹⁾.

In addition to local pain relief—targeting structures such as the masseter, temporalis, TMJ, and intraoral tissues—improvements were also observed in related symptoms, including jaw-opening limitations and emotional aspects like anxiety and mild depression. In this regard, Reis et al.⁽¹²⁾ emphasized that auriculotherapy positively impacts quality of life, reduces chronic pain, and improves sleep quality, making it a valuable tool for psychosomatic conditions.

Among athletes, the benefits of auriculotherapy also appear to extend to sports performance and physiological recovery. Noll et al.⁽¹³⁾ reported improved parameters such as maximal oxygen uptake, heart rate, and blood lactate levels, suggesting that auricular stimulation may contribute to

more efficient recovery after intense exercise. Similarly, Li *et al.*⁽¹⁾ examined the combination of auriculotherapy with mind-body exercises (Qi Gong). They found reductions in pre-competition anxiety, enhanced self-control, and improved emotional and physical balance. These findings are particularly relevant in high-performance sports, where stress is a known trigger or aggravating factor for TMD.

Despite these favorable outcomes, essential limitations must be acknowledged. The heterogeneity of protocols, lack of standardized auricular point selection, and methodological variability among studies hinder direct comparison of results. Seritella *et al.*⁽¹⁴⁾ highlighted the need for consistent, well-defined protocols to ensure clinical reproducibility. Additionally, Nielsen, Gereau, and Tick⁽¹⁵⁾ reported potential adverse effects, though rare, related to the use of invasive devices, underscoring the safer profile of non-penetrating materials such as seeds or magnetic pellets, which provide prolonged pressure stimulation without skin perforation.

Auriculotherapy has also shown high acceptability and effectiveness in specific populations, such as orthodontic and pediatric patients, especially in treating facial and muscle pain⁽¹⁴⁾. Protocols alternating the treated ear with each session and targeting specific points such as Shenmen, Subcortex, and Mandibular areas have proven effective in managing acute and chronic orofacial pain.

Furthermore, Rodrigues *et al.*⁽¹⁶⁾ reported that low-level laser auriculotherapy produced effects comparable to occlusal splint therapy in managing TMD's physical and emotional symptoms. Their findings suggest that combining both treatments may provide additional benefits. Simma, Simma, and Fleckenstein⁽¹⁷⁾ also supported using microsystem acupuncture as a viable complementary approach, showing rapid pain relief and the potential to assess immediate therapeutic effects. Their data indicate that myofascial findings play a significant role in the symptomatology of TMD, particularly pain.

In academic settings, Vieira *et al.*⁽¹⁸⁾, in a pilot randomized trial with 26 students, found that auriculotherapy effectively reduced situational anxiety before exams, lowered salivary cortisol levels, and improved sleep quality. These outcomes highlight the neuroendocrine modulation potential of auriculotherapy in high-stress environments.

Despite encouraging results, this review has certain limitations. The study was limited to two databases (PubMed and SciELO), which may have excluded relevant literature from other sources. Furthermore, the review covered only studies published between 2019 and 2024, which may restrict the comprehensiveness of the findings. The lack of standardized auriculotherapy protocols also poses a limitation in terms of reproducibility and comparability of the included studies.

CONCLUSION

The analysis of the available studies indicates a significant association between TMD and athletic performance, particularly among high-performance athletes. TMD affects not only physical health but also psychological well-being and competitive outcomes, often exacerbated by emotional stress and pre-competition anxiety.

In this context, integrative therapies such as auricular acupuncture and auriculotherapy have shown promising clinical effects, including pain relief, anxiety reduction, and improved quality of life. When used with conventional treatments, these approaches may enhance therapeutic outcomes for athletes with TMD.

However, there is a notable lack of clinical studies specifically investigating the use of auriculotherapy for TMD treatment in athletic populations, as well as an absence of standardized protocols regarding techniques, point selection, and treatment frequency. Furthermore, the scope of professional regulation and training required for implementing these interventions in sports contexts remains unclear.

Therefore, further rigorous clinical trials with well-defined methodological designs are needed to assess the efficacy and safety of these interventions in athletes with TMD. In summary, although still emerging, auriculotherapy appears to be a viable and promising therapeutic option, with the potential to support pain management, enhance physical performance, and contribute to emotional regulation in athletic settings.

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