

## **Acupuncture: Chinese therapeutic technique and its applications in dentistry**

**Acupuntura: Técnica terapêutica chinesa e suas aplicações em odontologia**

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Received: 08/09/2024 | Revised: 08/16/2024 | Accepted: 08/17/2024 | Published: 08/21/2024

**Pedro Guimarães Sampaio Trajano Dos Santos**

ORCID: <https://orcid.org/0009-0001-5720-603X>

Faculdade de Odontologia do Recife, Brazil

E-mail: [pedroguimaraessampaio@gmail.com](mailto:pedroguimaraessampaio@gmail.com)

**Irene Alcantara Eiras Silva**

ORCID: <https://orcid.org/0009-0009-0413-0092>

Faculdade de Odontologia do Recife, Brazil

E-mail: [irenealc9@gmail.com](mailto:irenealc9@gmail.com)

**Maria Eduarda Maldonado Coimbra do Nascimento**

ORCID: <https://orcid.org/0009-0007-4768-3848>

Faculdade de Odontologia do Recife, Brazil

E-mail: [mariaeduardamcnascimento@gmail.com](mailto:mariaeduardamcnascimento@gmail.com)

**Maria Clara Domingues da Silva**

ORCID: <https://orcid.org/0009-0006-9788-8529>

Faculdade de Odontologia do Recife, Brazil

E-mail: [mariaclaradomingues1307@gmail.com](mailto:mariaclaradomingues1307@gmail.com)

**Rodolfo Scavuzzi Carneiro Cunha**

ORCID: <https://orcid.org/0000-0001-7110-848X>

Faculdade de Odontologia do Recife, Brazil

E-mail: [scavuzzi@gmail.com](mailto:scavuzzi@gmail.com)

**Paula Andréa de Melo Valença**

ORCID: <https://orcid.org/0000-0002-1433-5632>

Faculdade de Odontologia do Recife, Brazil

E-mail: [valensa@gmail.com](mailto:valensa@gmail.com)

**Luciano Barreto Silva**

ORCID: <https://orcid.org/0000-0002-1508-4812>

Faculdade de Odontologia do Recife, Brazil

E-mail: [lucianobarreto63@gmail.com](mailto:lucianobarreto63@gmail.com)

### **Abstract**

**Objective:** The objective of this article is to talk about acupuncture, showing its origin and history, showing how it works, creating an interface between this practice and dentistry, addressing the benefits of this technique in dental treatments. **Methodology:** To compose this review article, searches were carried out for studies, articles, monographs and gray literature books that could contain a large amount of information, enriching the manuscript, bringing more scientific and current basis, thus, these searches were carried out on the basis data such as: Science Direct, Web of Science, DeCs, Scielo, PROSPERO, The Brazilian Journal of Health Review, VHL/BIREME, CAPES Journal Portal, The Cochrane Library, PUBMED and Google Academy. **Results:** Acupuncture is an ancient technique, created in China and which has spread throughout the planet, being something that has great use within medicine and dentistry, in treating problems such as: orofacial pain, TMD, neuralgia of the trigeminal and having anesthesia and analgesia function. **Conclusion:** It was seen that acupuncture is a Chinese technique that has great utility within dentistry, with a range of benefits within problems that are commonly seen in the clinical life of a dental surgeon and that affect the health of several people during the throughout life, thus being a powerful tool when used appropriately by dentists who are trained in this technique.

**Keywords:** Acupuncture; Temporomandibular joint dysfunction syndrome; Orofacial pain; Analgesia; Trigeminal neuralgia; Anesthesia.

### **Resumo**

**Objetivo:** O objetivo deste artigo é falar sobre a acupuntura, mostrando sua origem e história, trazendo sua forma de funcionamento, realizando uma interface dessa prática com a odontologia, abordando os benefícios dessa técnica em tratamentos odontológicos. **Metodologia:** Para compor este artigo de revisão foram realizadas buscas por estudos, artigos, monografias e livros de literatura cinzenta que pudessem conter grande quantidade de informações, enriquecendo o manuscrito, trazendo embasamento mais científico e atual, assim, essas buscas foram realizadas com base dados como: Science Direct, Web of Science, DeCs, Scielo, PROSPERO, The Brazilian Journal of Health Review,

BVS/BIREME, Portal de Periódicos CAPES, The Cochrane Library, PUBMED e Google Academy. Resultados: A acupuntura se trata de uma técnica milenar, criada na china e que foi se disseminando por todo o planeta, sendo algo que tem grande uso dentro da medicina e na odontologia, em tratamentos de problemas como: dores orofaciais, DTM, neuralgia do trigêmeo e tendo função de anestesia e analgesia. Conclusão: Foi visto que a acupuntura se trata de uma técnica chinesa que possui grande utilidade dentro da odontologia, com uma gama de benefícios dentro de problemas que são comumente vistos na vida clínica de um cirurgião dentista e que acometem a saúde de várias pessoas durante o decorrer da vida, sendo assim, uma ferramenta poderosa quando utilizada da forma adequada por dentistas que possuem capacitação nessa técnica.

**Palavras-chave:** Acupuntura; Síndrome da disfunção da articulação temporomandibular; Dor orofacial; Analgesia; Neuralgia do trigêmeo; Anestesia.

### Resumen

Objetivo: El objetivo de este artículo es hablar sobre la acupuntura, mostrando su origen e historia, mostrando cómo funciona, creando una interfaz entre esta práctica y la odontología, abordando los beneficios de esta técnica en los tratamientos odontológicos. Metodología: Para la composición de este artículo de revisión se realizaron búsquedas de estudios, artículos, monografías y libros de literatura gris que pudieran contener una gran cantidad de información, enriqueciendo el manuscrito, aportando una base más científica y actual, por lo que estas búsquedas se realizaron sobre los datos base tales como: Science Direct, Web of Science, DeCs, Scielo, PROSPERO, The Brazilian Journal of Health Review, BVS/BIREME, CAPES Journal Portal, The Cochrane Library, PUBMED y Google Academy. Resultados: La acupuntura es una técnica milenaria, creada en China y que se ha extendido por todo el planeta, siendo algo que tiene gran utilidad dentro de la medicina y odontología, en el tratamiento de problemas como: dolor orofacial, TTM, neuralgia del trigémino y como anestesia y analgesia. función. Conclusión: Se vio que la acupuntura es una técnica china que tiene gran utilidad dentro de la odontología, con una gama de beneficios dentro de problemas que comúnmente se ven en la vida clínica de un cirujano dentista y que afectan la salud de varias personas a lo largo de la vida. siendo así una poderosa herramienta cuando es utilizada adecuadamente por odontólogos capacitados en esta técnica.

**Palabras clave:** Acupuntura; Síndrome de disfunción de la articulación temporomandibular; Dolor orofacial; Analgesia; Neuralgia trigeminal; Anestesia.

## 1. Introduction

The use of acupuncture as a therapeutic approach has been adopted in the West since the 1970s, when the World Health Organization (WHO) began endorsing the practice for certain health conditions (Ma et al., 2016). However, the earliest historical records of acupuncture indicate a therapeutic practice that transcends five millennia, with origins attributed to the ancient Chinese civilization (Vickers et al., 2018). This ancestral medical system, intrinsically linked to Taoist philosophy, emerged in a cultural context where the perception of health was deeply intertwined with the concept of energetic balance between Yin and Yang (Ma et al., 2016).

Traditional Chinese Medicine (TCM), to which acupuncture belongs, posits that pathological states of the organism result from an imbalance in the body's vital forces, known as "Qi," which can be influenced by exogenous factors, such as climatic conditions, and endogenous ones, primarily represented by human emotions (Vickers et al., 2018). The interaction between these forces was conceived as a dynamic phenomenon capable of causing disease when disturbed (Ma et al., 2016).

Contemporary studies have explored the neurobiological and biochemical foundations of this ancient practice, suggesting mechanisms of action that include modulation of the endocrine and immune systems, as well as neurotransmitter regulation (Vickers et al., 2018). Thus, the practice of acupuncture involves the insertion of fine needles into specific points of the body, known as "acupoints," which are distributed along meridians, channels through which "Qi" flows (Ma et al., 2016). According to TCM, the manipulation of these acupoints allows the restoration of a harmonious energy flow, promoting balance between the antagonistic and complementary forces of Yin and Yang (Vickers et al., 2018). This rebalancing process is understood as fundamental to maintaining bodily homeostasis and alleviating a wide range of somatic and psychological symptoms (Ma et al., 2016).

The application of needles to strategic acupoints has been correlated, in modern neurophysiological studies, with the stimulation of afferent nerve fibers, leading to the activation of specific neurological circuits that can result in the release of

endorphins, serotonin, and other substances that mitigate the perception of pain and promote well-being (Vickers et al., 2018). Thus, the objective of this study was to conduct a literature review on the use of acupuncture as a complementary therapy in dental treatment, its indications, and applications in various areas of dentistry.

## 2. Methodology

This study is a narrative literature review, therefore, the article by author Rother (2007) was used as a basis in the construction, development and finalization of this review, which also used his methodology to obtain rich and necessary information. To compose this review article, searches were carried out for studies, articles, monographs and gray literature books that could contain a large amount of information, enriching the manuscript, bringing more scientific and current basis, thus, these searches were carried out on the basis data such as: Science Direct, Web of Science, DeCs, Scielo, PROSPERO, The Brazilian Journal of Health Review, VHL/BIREME, CAPES Journal Portal, The Cochrane Library, PUBMED and Google Academy. In order to obtain the maximum amount of information to compose the article, research was carried out using the following descriptors: Acupuncture; Temporomandibular Joint Dysfunction Syndrome; Orofacial Pain; Analgesia; Trigeminal Neuralgia; Anesthesia.

## 3. Results

### 3.1 What is Acupuncture?

Originating from Chinese and used for more than 3,000 years (Whittaker, 2004), the word acupuncture in Latin has the meaning of: “acus, needle” and “puncture, puncture”, and in Chinese "In Huo or Tsen Tsio" which has as meaning "metal and fire", it has been used as a form of treatment for various problems in the human body for a long time, a technique that was created in China, but which was soon distributed throughout the West and other continents later, if making it one of the most used alternative therapies when it comes to "pain relief", this practice being commonly passed down through generations as it belongs to Western culture, and which continues to be used today (Wang et al., 2008).

The translation "Metal and Fire" came from the way in which acupuncture and its components are used, which have their points distributed throughout the body, which will be punctured with needles that will be heated or not. , through the heat produced by burning a certain herb (Chonghuo, 1993), aiming not only to treat a compromised area, but rather to trigger a stimulus to the balance and compensation mechanism throughout the human body (Wen, 2006), through the application of needles in a given acupoint, which are the places on the skin that have an intimate relationship with blood vessels, nerves, tendons, joint capsules and periosteum (Wu, 1990), thus enabling an interaction with the central nervous system, which is responsible for capturing the stimulus , generating a nervous response from the body that seeks to bring about homeostasis in the body (Farber & Timo-Iaria, 1994).

### 3.2 History of Acupuncture

Acupuncture had its origins in China from 700 BC, through the manufacture of stone needles, which were used by the Chinese during the Stone Age to drain abscesses through stimulation in specific areas of the body (Wen, 2006), which later were replaced by bronze needles (Ma, 2006), which were disseminated throughout the East, arriving in Japan during the Tang dynasty around 400 AD, and which later had contact with Europe through the West India Company, where the Jesuit Franciscus Xavier had contact with this practice in Japan around 1549, together with other doctors and Jesuits who learned about the use of this Chinese practice and its benefits, making reports and illustrations about it, which served to encourage other health professionals

to come into contact with this new therapy, contributing to the spread of acupuncture across all territories on the planet (Dallas, 2008; Schippers, 1993; Michel, 2005).

### **3.3 How does acupuncture work?**

Classical Chinese acupuncture works by generating stimuli through the insertion of needles into the body at specific points where there is a large accumulation of sensory nerve endings (Wen, 1989). It should be noted that there are several types of acupuncture, and other tools are used in addition to the traditional popular image of the needle. In acupuncture, treatments can be found using lasers, tapes or tablets. Acupuncture points are divided and categorized by type: 1 is motor points, 2 is located in the dorsal and ventral parts and 3 has a diffuse neurometer. All of these points are located in lines, which in turn follow the main nerves, as well as blood vessels in the body (Gunn et al. 1976). Acupuncture alters the blood circulation of a specific point, altering the dynamics of micro dilation. Other points calm the muscle mass, reducing inflammation, spasms, and pain. Some points can trigger the release of hormones such as cortisol and endorphins, causing analgesia. Thus, it is seen that the combination of these hormones triggers an analgesic effect on the patient (Wen, 1989).

### **3.4 Benefits of acupuncture within society**

In the quest to reduce pain and adverse effects on the body, common allopathic medicines are not always able to mitigate these adversities in all patients, which creates greater space for alternative and complementary therapies, such as acupuncture, which its application brings several benefits for patients (Faria et al., 2021). Due to its physiological action, caused by the insertion of needles, neurotransmitters such as enkephalin, serotonin and cortisol are released in the individual's body, causing, respectively, a reduction in pain, antidepressant and anti-inflammatory effects (Pereira et al., 2015; Rosted, 2000). In this way, it is possible to use acupuncture to reduce symptoms of chronic diseases that cause intense pain, such as fibromyalgia and chronic headache due to its analgesic effect, for example (Pereira et al., 2020; Sobral et al., 2024).

### **3.5 Harms, contraindications and difficulties of acupuncture**

Acupuncture, as it is considered a non-invasive technique that stimulates the production of the body's own substances, is considered safe (Garbelotti et al., 2016), however the possibility of adverse effects caused, mainly by poor insertion and removal of needles, is not denied. This inaccuracy can lead to nausea, dizziness, increased pain in the short term, in addition to bleeding and dermatological conditions at the punctured site, such as transient erythema, which consists of a hypersensitivity reaction, causing a reddish appearance to the skin (Vianna et al., 2008; Lamoreux et al., 2006). Furthermore, the insertion of non-sterilized needles can generate local infection and even contamination by infectious diseases, such as hepatitis, which can result in fatality, due to the severity of the disease (Pereira et al., 2015).

Furthermore, this complementary therapy cannot always be indicated, especially in cases of patients affected by heart valve pathologies and possessing a pacemaker, that is, people with cardiovascular adversities (Sarlani, 2003). This technique is also not very interesting for individuals who use morphine (drug) and cortisone (corticosteroid) to a considerable extent.

Finally, despite presenting diverse scientific evidence of clinical benefits in treating diseases, acupuncture will not always be effective (Vianna et al., 2008). Depending on the condition being treated, such as in cases of degenerative abnormalities of the temporomandibular joint, its effectiveness is considerably reduced (Vachiramon & Wang, 2005). Furthermore, genetic variations also influence the efficiency of this Chinese therapy, such as patients with a lack of endorphin receptors or deficiency in the production of this hormone, known for its analgesic action and induction of euphoria (Rosted & Rosted, 2000; Roth-Deri et al., 2008).

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### **3.6 Benefits of acupuncture in dentistry**

Acupuncture in dentistry is a minimally invasive, low-cost alternative therapy that allows the dentist to ensure safer and more comfortable treatment for the patient, helping to control anxiety and phobias in adults and children who may be afraid of needles, as there are several types of acupuncture that are not performed using needles, such as low-intensity laser, silicon tablets, and magnetic stimulation (Avisa et al., 2018; Michalek et al., 2012). Because it has an anxiolytic effect similar to midazolam, through the use of acupuncture the use of anesthetics and analgesics can be avoided, facilitating care for elderly, diabetic, hypertensive, and fibromyalgia patients (Dellovo et al., 2019; Scognamillo et al., 2019). Several specialties are already using this therapy for pain relief and control of post-surgical complications that may occur. This practice facilitates periodontal, restorative, orthodontic treatments and tooth extractions (Branco et al., 2005; Nader, 2003). Through acupuncture, the dentist can have a better diagnosis of several dental problems related to craniofacial pain, from bruxism to trigeminal neuralgia, by eliminating secondary pain, enabling a more accurate diagnosis for each case (Ichida et al., 2017). In addition, when used appropriately, acupuncture tends to optimize consultation time (Vianna et al., 2008).

### **3.7 Acupuncture in dental treatments**

#### **3.7.1 DTM**

Temporomandibular joint dysfunction (TMD) is a problem related to oral health that can have various origins and ways of manifesting itself in the individual. Many health professionals, and especially dentistry, have used acupuncture in the treatment of TMD to reduce pain and its severity (da Silva et al., 2022). Scientific productions on the importance of acupuncture in the treatment of TMD reveal that This ancient Chinese technique can relieve pain, relax muscles and reduce the severity of the disease. Treating TMD with acupuncture is as effective as other more invasive procedures, however, it is still little explored by health professionals.

TMD is similar to other rheumatological and musculoskeletal disorders and, due to little knowledge about the natural course of this change, it is necessary to make a special effort to avoid more aggressive and irreversible therapies. Acupuncture fits perfectly into these parameters and, from a neuroanatomical point of view, shows how it works for analgesia (Reis et al., 2021). It has anti-inflammatory, anxiolytic, myorelaxant effects and stimulates the immune response. Acupuncture offers a series of benefits for patients with TMD, as this technique reaches the nervous system, thus enabling a better quality of life. However, it is necessary that the professional when using acupuncture in the treatment of this disease has knowledge about which points should be stimulated, how the blood circulation process occurs, so that it is possible to promote muscle relaxation, reduce inflammation, and also of pain (Garbelotti et al., 2016).

#### **3.7.2 Orofacial Pain**

Acupuncture, used correctly, within its limitations, following recommendations and practiced by trained professionals, tends to bring great benefits to the dentist, optimizing working time in the office. Several studies and clinical trials have demonstrated the effectiveness of acupuncture in treatment of pain in general, and in dentistry it has been effective in the treatment of orofacial pain such as idiopathic trigeminal neuralgia, herpes zoster, maxillary sinusitis, dental pain, TMJ arthrosis,

as well as in patients with xerostomia, bruxism and TMD, in addition to controlling and significant reduction in associated comorbidities such as anxiety and odontophobia (Sarhani, 2003; Yilmaz & Yildirim, 2023; Yang et al., 2022).

### **3.7.3 Anesthesia and Analgesia**

As previously mentioned, one of the effects achieved in acupuncture is analgesia, that is, it helps to reduce pain (Rosted & Rosted, 2000), which becomes very useful in promoting patient well-being in the dental area.

In dentistry, the classification of pain can be considered odontogenic (coming from the dental tissue and its supporting structures) and non-odontogenic (coming from other tissues such as bones, joints and nerves) (Santos et al., 2022), with the pain of this The first type is less suitable for treatment via needle insertion, due to its lower effectiveness (Scognamiglio-Szabó & Bechara, 2001). On the other hand, non-odontogenic pain, such as that caused by Temporomandibular Disorder, Trigeminal Neuralgia and other orofacial pain, has greater scientific evidence regarding pain reduction after acupuncture sessions, which makes it more indicated in these cases (Vianna et al., 2008 ; Campana et al., 2013).

Furthermore, the practice of using local anesthesia in the dental office, which is so common in aiding various dental treatments - such as surgical and periodontal procedures - can have its effect enhanced by inserting needles into acupoints (Parise et al., 2017; Pereira et al., 2015; Branco et al., 2013). For this to occur, it is necessary to perform acupuncture before anesthetizing the patient, which causes partial anesthesia of some nerve fibers in the area, and consequently, the effect of anesthesia occurs more quickly and reduces the patient's discomfort (White et al., 2013).

### **3.7.4 Trigeminal Neuralgia**

Trigeminal neuralgia is a rare disease that causes enormous pain, categorized as a facial neuropathic pathology, affecting the 5th pair of nerves, called the trigeminal nerve, located in the skull (Treede et al., 2015). Alternative treatments pre-surgical procedures are recommended to relieve this pain, acupuncture is one of the main treatments, functioning as an auxiliary method, it causes a temporary reduction in pain, to obtain any results through acupuncture it will be necessary at least 10 sessions, it is worth highlighting that during some sessions the patient may feel some relief, already showing some results of the treatment during the sessions, preventing the patient from needing to consume many types of analgesics, becoming a safer option for pain relief and bringing a better living condition to the patient (Campana et al.,2013).

## **4. Discussion**

Acupuncture, although not often discussed in the field of dentistry, is very useful for dentists, who can use it on patients of different ages and genders, as it is a technique that does not pose any obstacles related to any of these aspects in particular, and is therefore a great key that can boost the professional career of the surgeon, making him/her a differentiator within dentistry, as it is a technique that few dentists use and that, above all, will improve the health of the patient treated.

One of the great benefits of acupuncture associated with dental treatments is the fact that it does not use medications that can cause allergies and reactions, serving as the first option for various problems that are affecting people with a history of allergies, and is also useful for people with kidney or liver failure or who have gastric problems, as these are people who cannot take many medications. Another great positive point is the financial cost associated with this Chinese technique, which is a low monetary cost when compared to traditional pharmaceutical industrial medicines, which generate a high cost of expenditure for the surgeon, which is often not even worth it in cases where the medicine does not produce the expected effect, with acupuncture being an option that often triggers better and more financially accessible responses for both the patient and the professional.



When a large part of the population develops TMD, orofacial pain, among other problems, they begin to feel pain that usually starts out mild, but is often not taken seriously. In other words, they do not seek treatment or self-medicate. This can lead to worsening of the pain symptoms, which can become more intense and can even be a mild pain that causes great discomfort to the patient, who ends up seeking treatment at the dentist's office. This is how acupuncture comes into play, due to its great analgesic effect, and can be used as a treatment that eliminates the pain symptoms and provides relief to the patient, so that, together with other specific treatments for the respective problems that are plaguing the patient's life, rehabilitation can be achieved.

Even though acupuncture has a number of benefits, a large part of the population ends up rejecting this treatment option because they are afraid of small, thin needles, rejecting the treatment that could solve the problem that is harming them. Another factor that hinders the practice of this technique is the fact that many people believe that acupuncture does not work, that it is a placebo effect. Therefore, it is necessary that more and more research be carried out to prove the effectiveness of this technique, which already has evidence but is often contested.

## 5. Conclusion

Dentistry has been advancing more and more over the years, using new technologies, new instruments, substances and innovative materials together with new therapies created in recent years. However, dentists often end up worrying too much about creating new techniques but forgetting about those that have existed for years, such as acupuncture, which is an ancient technique but continues to be little used in dentistry.

However, acupuncture is a therapy that has a network of benefits when linked to dentistry, allowing the dentist to have an alternative practice that is highly effective as a treatment for various problems, such as TMD, which affects a large part of the population, orofacial pain, trigeminal neuralgia, better known as "suicide pain", because it is a condition that causes extreme pain, but which can be treated through acupuncture, in addition to its role in triggering analgesia and anesthesia.

Therefore, it is essential that more dentists become aware of this practice, seek training and start practicing it during their clinical life, allowing patients to have more effective treatment options that will improve their health. It is extremely important that more and more dentists start to publicize the results of the application of this technique, through case reports, clinical trials and studies, spreading the word in the scientific community, disseminating this technique.

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