

## REVIEW

# Holistic pediatric dentistry, a comprehensive approach based on natural and traditional medicine

## Odontopediatría holística, un enfoque integral desde la medicina natural y tradicional

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### ABSTRACT

The procedures of Traditional Natural Medicine have in common the aim of preventing and treating illnesses. This type of medicine is a mixture of all those healing arts that have formed part of the cultural heritage of each nation. Its use dates back to the earliest times when man sought remedies for his ailments in the flora of his habitat. With the aim of describing the main techniques of Natural and Traditional Medicine of interest in paediatric dentistry, a bibliographical consultation of 14 documents in libraries and digital portals was carried out, making use of the most up-to-date information related to the subject. It was concluded that Natural and Traditional Medicine has an important therapeutic application in children from the stomatological point of view, which indicates that the culture of its use in this science should continue to be perfected.

**Keywords:** Natural and Traditional Medicine; Paediatric Dentistry; Children.

### RESUMEN

Los procedimientos de la Medicina Natural Tradicional tienen en común el objetivo de prevenir y tratar las enfermedades. Este tipo de medicina es una mezcla de todas aquellas artes curativas que han formado parte del patrimonio cultural de cada nación. Su empleo data desde los tiempos más remotos en los que el hombre buscaba remedio para sus males en la flora de su hábitat. Con el objetivo de describir las principales técnicas de la Medicina Natural y Tradicional de interés en odontopediatría, se realizó una consulta bibliográfica de 14 documentos en bibliotecas y portales digitales, haciéndose uso de la información más actualizada y relacionada con el tema. Se llegó a la conclusión de que la Medicina Natural y Tradicional tiene una aplicación terapéutica importante en los niños desde el punto de vista estomatológico, lo que indica que se debe continuar perfeccionando la cultura sobre su empleo en esta ciencia.

**Palabras clave:** Medicina Natural y Tradicional; Odontopediatría; Niños.

## INTRODUCTION

In Cuba, the origins of Natural and Traditional Medicine (NTM) are virtually unknown, since the indigenous population was exterminated at the beginning of colonization, and the different African ethnic groups that

made up the slave population. However, they contributed elements of healing practices, leaving few records.<sup>(1)</sup>

At the end of the 19th century, there are records of the practice of Traditional Chinese Medicine in Cárdenas, where Dr. Chan Bom Bian worked and achieved notable success in the prescription of medicinal plants. His approach gave rise to the famous phrase: “Not even a Chinese doctor can save this one,” which reflected the high regard in which the Asian doctor was held for his use of this therapy.<sup>(1)</sup>

Since the 1970s, the World Health Organization has promoted the use of NTM modalities that are effective and safe for health care, with the criterion of their integration into national medical systems. In addition, CAM is now part of the Cuban state’s health strategy, as guideline no. 158 of the Economic and Social Policy of the Party and the Revolution states that “maximum attention should be given to the development of CAM.”<sup>(2)</sup>

With the triumph of the Revolution, the study of NTM began to be encouraged. In the 1980s, the National Health System developed a policy aimed at expanding knowledge of this discipline, which includes various therapies called natural, alternative, parallel, or complementary, among which are: Acupuncture, Herbal Therapy or Phytotherapy, Ozone Therapy, Hydrotherapy, Aromatherapy, Peló ideas, Hypnosis and Meditation, Homeopathy, Massage, Floral Therapy, Tai Chi, Chromotherapy, and Laser Therapy.<sup>(1)</sup>

Since its inception, traditional medicine has taken a comprehensive approach to health issues by studying human beings, particularly sick people, and recognizing that the person must be analyzed together with the disease. In this way, it is not only interested in the physical symptoms of the disorder but also in the subject’s lifestyle, way of thinking, emotions, and interests, as well as their reactions to the disease process, which is of diagnostic and therapeutic importance for NTM. For this reason, many authors use a more comprehensive term to refer to it: Bioenergetic Medicine, which includes, based on ancient techniques, a set of unconventional methods aimed at achieving the harmonious functioning of the human organism.<sup>(3)</sup>

Although the use of NTM modalities has been known in Cuba since earlier times, their use increased significantly in the country’s health services in the 1990s. This also occurred in stomatological care, a specialty initially supported by postgraduate courses and scientific events, which progressively incorporated these forms of treatment into healthcare practice.

With the introduction of NTM in dentistry, there was a change in the therapeutic approach to oral and maxillofacial conditions.<sup>(2)</sup>

Currently, MNT is widely used in dental services throughout the country, integrating favorably with the therapeutic possibilities for solving various oral health problems, as well as with procedures that are part of dental treatments.<sup>(3)</sup>

Precisely with the development, study, and application of MNT, the use of different techniques in the treatment of oral complex conditions in children has been introduced. This topic requires greater understanding and analysis by dental professionals. Therefore, this work aims to describe the main MNT techniques of interest in pediatric dentistry.

## DEVELOPMENT

As its name suggests, NTM is considered a trend that combines therapeutic thinking and action, encompassing a variety of specific expressions, many of which come from ancient or relatively old cultures. In contrast, others are much more recent or do not correspond to tradition.<sup>(4)</sup>

NTM aims to prevent and treat diseases by activating the body’s capacities or natural biological resources, while harmonizing it with nature.<sup>(5)</sup> It includes homeopathy, phytotherapy, acupuncture, ozone therapy, apitherapy, and magnetotherapy, among others.<sup>(6)</sup>

Treatment with CAM is more complex in children, as more studies are needed to achieve a better therapeutic approach. However, its effectiveness has been proven in stomatology, mainly with the use of ozone therapy, phytotherapy, laser therapy, hypnosis, and acupuncture in the treatment of anxiety. According to the articles reviewed by the authors of this research, it can also be applied in childhood bruxism.

The management of pediatric patients is not an easy topic to address in practice, as a range of factors come into play during a visit to the dentist, which is why both children and mothers react differently depending on each individual.<sup>(7)</sup>

Anxiety has been established as a multisystemic response to a belief of danger or threat, which is an individual, subjective experience that varies between people and has a profound impact on daily life, being a significant barrier to seeking dental care, which has been resolved in the consultation room with the application of hypnosis and acupuncture techniques.<sup>(7)</sup>

Hypnosis: To understand this topic, we must first define suggestion. Suggestion is the first step in hypnosis, in which the individual accepts the presentation of an idea, impulse, or belief without necessarily having a logical reason for doing so. Suggestions do not need to be verbal and can occur at various sensory levels (hearing, taste, smell, touch, sight).<sup>(8)</sup>

Hypnotic techniques are mainly used in children to manage several common problems related to dentistry, such as dental anxiety, dental phobia, specifically pain control in conservative treatment and extractions, greater

tolerance for orthodontic appliances, as well as a complement to inhalation sedation and the modification of unwanted oral habits such as thumb sucking.

The advantages of hypnosis in dentistry have been mentioned in the literature and are as follows:<sup>(8)</sup>

- No specialized equipment is required.
- The patient remains conscious.
- It has no pharmacological approach, so it has no side effects or effects associated with environmental pollution.
- It combines well with nitrous oxide inhalation sedation.
- It is safe.

Combined with conventional behavior management techniques, hypnosis is a more effective tool for helping children relax than traditional behavior management techniques.<sup>(8)</sup>

In his article Hypnosis in Dentistry, Burke states that children enter the hypnotic trance easily and quickly. The only essential requirement is that the person hypnotizing the children gains their trust and maintains their attention. However, according to several studies, it should be noted that the child must be able to understand explanations, which would exclude children under 3 years of age and those with severe mental disabilities. The assessment of a patient's susceptibility to hypnosis should be based on the patient's chronological and mental age, intelligence, emotional stability, and social environment.<sup>(8)</sup>

Acupuncture is a technique in which disease is treated by inserting needles into various points on the body, known as acupuncture points. Acupuncture has been reported to be effective in treating dental problems such as anxiety, temporomandibular dysfunction syndrome, pain, and Sjögren's syndrome.<sup>(7)</sup>

Childhood bruxism is defined by the involuntary clenching or grinding of the teeth, and its etiology is multifactorial. When not treated early, it can cause damage to the stomatognathic system, causing orofacial changes.<sup>(9)</sup>

Currently, physical therapy has also been used as one of the ways to treat this disorder, and the most commonly used methods are: transcutaneous and electrical neuromuscular stimulation by microcurrent, ultrasound, cryotherapy, infrared therapy, therapeutic massage, kinesiotherapy, acupuncture, and low-level laser therapy.<sup>(9)</sup>

Treatment with low-power laser is effective in reducing symptoms derived from bruxism, such as orofacial pain, swelling, and hyperemia. However, studies demonstrating its effectiveness are lacking.<sup>(9)</sup>

According to the Brazilian Dental Association, bruxism is related to involuntary jaw movement, thus making the analogy that tooth replacement is related to the possible development of bruxism untenable and unfounded. Because it originates in the central nervous system, orthodontic or orthopedic appliances do not promote morphological changes.<sup>(10)</sup>

Low-power laser therapy is known by different names, such as cold laser or therapeutic laser, and its power does not exceed 0,5 W. It is found between visible red light and near infrared (IR) within the electromagnetic spectrum, from 630 nm to 980 nm. In dentistry, the most commonly used lasers are diode lasers, which use gallium arsenide and aluminum as the active medium and emit between 808 and 830 nm, with powers between 0,02 and 0,1 W. Indium aluminum gallium phosphide lasers are also used, with wavelengths between 635-690 nm and powers between 0,1 and 0,25W, as well as He-Ne lasers.<sup>(11)</sup>

#### **Indications for laser therapy in pediatric dentistry:<sup>(11)</sup>**

**Treatment of mucositis.** Oral mucositis is a common complication of chemotherapy and radiotherapy. It affects the mucosa of the gastrointestinal tract, especially the oral cavity and pharynx. Clinically, mucositis begins asymptotically, followed by erythema, a burning sensation, and increased sensitivity to food. The erythema may progress to areas of desquamation, followed by the appearance of ulcers associated with dysphagia and reduced oral intake, with a series of clinical consequences that affect patients' quality of life. According to Campos, laser therapy offers a new approach to preventing and treating OM, reducing pain and stimulating the salivary glands.

**Orthodontics.** It is known that after the application of orthodontic forces, there is a period of initial discomfort or pain that lasts 2 to 4 days. Some authors have taken advantage of the analgesic properties of low-power lasers to reduce the discomfort caused by orthodontic adjustments, along with analgesic therapy. In addition to lowering initial pain, laser therapy can increase the speed of tooth movement by increasing osteoclastic activity on the pressure side and osteoblastic activity on the tension side. Laser therapy is also used for oral ulcerations induced by fixed orthodontic appliances.

**Dentin hypersensitivity.** When dentin is exposed to the oral environment, it becomes more sensitive to certain thermal stimuli. Therapeutic lasers have an analgesic effect while stimulating the formation of reparative dentin. Applying a laser to the neck of the teeth modifies the surface, resulting in an approximate 90% reduction in tooth sensitivity. This is caused by the tissue surface's remineralization and the dentinal

tubules' sealing.

Caries prevention. The development of methods to increase enamel resistance to demineralization has led to the topical application of chemicals containing calcium, phosphate, and fluoride.

Laser therapy in these preventive methods achieves a photochemical effect that stimulates mineral exchange in the enamel, with better preventive results. Thus, it is possible to achieve the remineralization of white spots with a combined fluoride and laser therapy.

Trauma management. Dental and oral soft tissue injuries can result from direct or indirect trauma caused by blows or accidents. They occur mainly in children and adolescents in the anterior region of the upper dental arch. Laser therapy can be used as an adjunct to the usual management of trauma, reducing pain and inflammation and restoring normal function to the affected tissues.

Trismus. The term "trismus" describes inflammatory contracture of the masticatory muscles. Its etiology may be traumatic (third molar extraction), infectious (abscesses and cellulitis of dental origin that invade the retromolar area and the pterygomandibular space, or pericoronitis of the lower retromolar area. Clinically, it is characterized by edema, acute pain, limited mouth opening, and sometimes dysphagia. The treatment of trismus consists of eliminating the causal factor and includes local physical therapy and pharmacotherapy (analgesics, anti-inflammatories, and muscle relaxants). Laser therapy can be used as a supportive treatment to reduce pain and promote relaxation of the facial muscles, thereby facilitating mandibular movements.

Teeth whitening has become one of the most popular dental procedures in recent years, with highly satisfactory results. No laser has a whitening effect on its own. Laser light accelerates the decomposition processes of hydrogen peroxide, which is commonly used in standard whitening techniques. This treatment can correct chromatic alterations on the tooth surface, whether extrinsic or intrinsic. It combines a 35% hydrogen peroxide gel and laser application. This method has been shown to lighten 5 to 7 shades from the original color.

Cold sores. Herpes simplex infection is common among adolescents.

Soft lasers have been shown to have a similar effect to acyclovir and have proven highly effective. If applied in the prodromal period, the cold sore will likely disappear in 2 to 3 days, with minimal symptoms, rather than the usual 8 to 14 days for the lesions to clear up. These lasers also reduce the frequency of recurrence of herpes zoster and post-herpetic lesions. Low-level laser therapy (LLLT) can be used during latency periods, i.e., between herpes infections, to reduce recurrence.

Aphthous ulcers are very common ulcerative lesions of the oral mucosa affecting more than 20 % of the population. They consist of loss of the oral epithelium, exposing the nerve endings of the underlying lamina, resulting in acute pain from irritating stimuli. Currently, therapeutic laser (LLLT) is used to treat aphthous ulcers due to its analgesic and biomodulation effects, which stimulate the healing process and reduce the duration of the lesions.

(LLLT) is used to treat aphthous ulcers due to its analgesic and biomodulation effects. These stimulate the healing process and consequently relieve pain and reduce recurrence.

Gingivitis. The traditional treatment of gingivitis in children and adolescents aims to control local (dental plaque) and general irritating factors, including the continuous practice of proper dental hygiene. In addition to these measures, treatment with a therapeutic laser achieves an anti-inflammatory Surgery. In pediatric dentistry, low-level laser surgery (LLLT) offers new alternatives for improving patients' quality of life. It promotes faster wound healing and reduces postoperative symptoms, such as pain and inflammation, without side effects. LLLT has positive biomodulation effects and stimulates tissue repair.

Pericoronitis. This is inflammation of the gum covering the crowns of partially erupted molars that have partially erupted. It usually presents as redness and/or mucosal inflammation, along with pain that can radiate to the ear and pharynx. Chewing can further traumatize the inflamed area and even cause trismus. In the presence of pain, therapeutic laser radiation has an analgesic and anti-inflammatory effect that significantly improves the clinical picture by up to 100 %. Still, it is essential to maintain proper hygiene in the area.

### **Temporomandibular disorder (TMD)**

TMD encompasses a range of clinical problems affecting the masticatory muscles, the temporomandibular joint, and associated structures. Different types of treatment are available for TMD. Low-level laser therapy has been used to reduce the signs and symptoms of the condition through its biostimulation, regenerative, analgesic, and anti-inflammatory effects.

Rare side effects have been reported with the use of therapeutic lasers. The most common of these is the onset of pain after the first application of the laser, which tends to subside after the second application. Drowsiness and vertigo have also been reported occasionally. Prolonged irradiation with therapeutic lasers is contraindicated in children who are still growing, have photosensitive skin, thyroid disorders, or epilepsy, and in the presence of bacterial infections without prior antibiotic coverage.<sup>(11)</sup>

The use of ozone in dentistry is based on its various actions on the body, including immunostimulation, analgesia, antihypoxia, antimicrobial detoxification, bioenergetics, and stimulation of biosynthesis through the



activation of carbohydrate, protein, and lipid metabolism.<sup>(12)</sup>

Most pediatric patients report fear and anxiety toward dental treatment. The advantages of ozone therapy in pediatric practice are based mainly on the fact that the application of ozone is a rapid, practical, easy, and especially painless procedure. Its use causes less anxiety compared to traditional dentistry due to its non-invasive nature. These aspects not only improve the operator's efficiency, but also patient compliance and tolerance to treatment, which helps achieve a positive relationship with the pediatric patient, which is the key to successful treatment that can be very effective when accompanied by ozone therapy. The treatment of dentoalveolar trauma is standard in the field of pediatric dentistry, and ozonated water can be used in the reimplantation of avulsed teeth without any harmful effects on periodontal cells, thanks to its biocompatibility with these cells, gingival fibroblasts, and oral epithelial cells.<sup>(13)</sup>

Phytotherapy has proven to be an effective alternative in pediatric dentistry, generally well accepted by those responsible for patients because it is a low-cost option with lower toxicity compared to synthetic drugs.<sup>(14)</sup>

Phytotherapeutic treatment is the use of medicines from medicinal plants or fresh vegetables to cure or prevent diseases and injuries.<sup>(14)</sup>

Therapy with medicinal plants has been practiced since the dawn of humanity. In Brazil, these practices were inherited from indigenous peoples, who later merged with the knowledge of Africans and European colonizers, becoming part of popular culture. This type of therapy has strong historical and cultural values, as the population, through ancestral oral tradition, recognizes its effectiveness and legitimacy.<sup>(14)</sup>

In 1978, the World Health Organization (WHO) supported traditional medicines. In 2006, the Ministry of Health approved the National Policy on Integrative and Complementary Practices in the Unified Health System, noting that phytotherapy "promotes community development, solidarity, and social participation." In addition, the use of medicinal plants is entirely sustainable and viable in Brazil due to its vast biodiversity. All these factors justified the creation of the National Policy on Medicinal Plants and Phytosanitary Products in June of the same year, which later served as the basis for the National Program on Medicinal Plants and Phytotherapeutics, implemented in 2009.<sup>(14)</sup>

A significant advantage of herbal medicines over synthetic products is their lower toxicity. This factor carries greater weight in treating special groups, such as the elderly, pregnant women, and children. Pediatric dentistry focuses more on prevention than cure. The main oral conditions, such as tooth decay and gingivitis, can be prevented with proper hygiene, but medicinal herbs can be great allies, especially in areas with limited economic resources.<sup>(14)</sup>

Well-known and widely used, phytotherapy is an excellent ally of pediatric dentistry, as it helps from the preparation of the patient to the treatment itself. This is an advantageous topic to explore, as patients already use the practice, especially in rural areas and different situations. In addition to being a less toxic alternative to traditional drugs, it is also a way to enhance the country's biodiversity.<sup>(14)</sup>

#### **Use of herbal products in pediatric dentistry:<sup>(14)</sup>**

##### *Pulpotomy*

In the study by Gupta, an aloe vera gel was applied after pulpotomy in fifteen patients to prevent post-treatment inflammation or infection. All patients obtained satisfactory results without abscesses, pain, or mobility. The patients were monitored two months after the procedure, and the positive results were confirmed. The primary teeth were then extracted and histologically evaluated, and all tissues were healthy.

The effectiveness of aloe vera was also tested on rat pulp tissue, with good results. The product is biocompatible and stimulates the formation of restorative dentin. Its therapeutic effect was similar to that of calcium hydroxide.

##### *Biofilm control*

Caries is the most prevalent finding in pediatric dentistry. It is a multifactorial problem, and the etiological factors are diet, oral hygiene, mechanical and chemical control of biofilm, considering the quality and quantity of brushing, socioeconomic status, and educational level of the child's parents.

In addition to caries, poor biofilm control also causes gingivitis, which is very common in children because they are not yet mature enough to understand the importance of oral health.

The professional should assess the patient's socioeconomic status, as this is a risk factor for periodontal disease. Early diagnosis is essential to prevent future periodontitis.

Clinically, there is bleeding on probing, reddish color, and edema. Treatment is carried out with plaque control through proper hygiene, which may or may not be aided by mouthwashes, with professional follow-up.

Herbal toothpastes have shown positive results in controlling biofilm, preventing caries, and gingivitis.

In one study, the action of toothpastes and mouthwashes based on the hydroalcoholic extract of *Lippia sidoides* Cham (rosemary pepper) was evaluated, and the results showed that herbal products are more effective than regular toothpaste in reducing the dental biofilm index.

Another study conducted by Albuquerque confirms the antimicrobial activity of *Lippia menosides* Cham extract in vitro on the microorganisms *Streptococcus mutans*, *Streptococcus sanguis*, *Streptococcus mitis*, *Streptococcus sobrinus*, and *Lactobacillus casei* compared to 0,12 % chlorhexidine.

A clinical evaluation comparing regular toothpaste and *Rosmarinus officinalis* Linn (rosemary) extract showed no significant differences between the two products: both achieved the same clinical efficacy.

Two clinical analyses of the effect of herbal mouthwashes based on pomegranate and chamomile extract concluded that they are effective in reducing dental biofilm and gingival bleeding. Both products have antimicrobial and anti-inflammatory actions and are suitable for recovering and maintaining periodontal health. However, pomegranate extract is less effective in reducing dental biofilm in chronic gingivitis and chronic periodontitis than chamomile extract and chlorhexidine.

#### *Canker sores*

One of the most common pathologies of the oral mucosa, aphthous ulcers can have various etiologies, including trauma, stress, genetic predisposition, allergies, nutritional deficiencies, infectious agents, and hematological abnormalities. They vary in size, shape, and number of lesions.

Phytotherapeutic treatment for this type of oral condition is carried out with plants that have anti-inflammatory action, such as clove (*Syzygium aromaticum* L.), plantain (*Plantago major* L.), sage (*Salvia officinalis* L.), pomegranate (*Punica granatum*), mallow (*Malva sylvestris*), among others.

A review of the literature by Martín Mauriño and Martínez-Sahuquillo brought together case and control articles investigating the efficacy of plants such as common myrtle (*Myrtus communis*), aloe vera (*Aloe vera*), myrrh (*Commiphora myrrha*), berberine (a compound extracted from plants), and allicin (a substance found in garlic). The effects were compared with a placebo and synthetic corticosteroid triamcinolone acetonide.

The effectiveness of herbal medicines was verified: they reduced pain and the size of the lesion and accelerated healing without adverse effects. Although they did not surpass the results of treatment with corticosteroids, it was concluded that natural therapy can be used in patients who do not want to use synthetic drugs for an extended period.

#### **Anxiety control during dental treatment**

A major challenge in pediatric dentistry is dealing with patient anxiety about treatment. The source of this problem may be past negative experiences, parental influence, or even fear of the unknown. The conditioning of the odontophobic patient should be carried out, first of all, with traditional behavioral control techniques, such as adapting the office environment, removing objects and sounds that may cause fear, using essential oil aromas in the waiting room, talking-showing-doing, controlling the tone of voice, positive reinforcement, distraction, among others. When conditioning techniques are not sufficient to prevent the child's phobia, herbal medications can be used to avoid the use of sedatives such as benzodiazepines.

A study by Dantas compared the effects of *Passiflora incarnata* and midazolam in controlling anxiety in patients undergoing molar extraction. Phytotherapy obtained excellent results, demonstrating its anxiolytic effect similar to that of synthetic medicine. It also keeps blood pressure and heart rate stable, which indicates its safety and efficacy. *Passiflora incarnata* can be used in children from two years of age, and the only contraindications for the use of this medication are hypersensitivity and lactose intolerance.

A study comparing the effectiveness of *Valeriana officinalis* L. and a placebo in controlling anxiety in patients undergoing bilateral extraction of lower third molars found that the herbal medicine has anxiolytic effects and can be used for conscious sedation. Valerian has no contraindications for pediatric use.

The literature on natural and traditional medicine in pediatric dental patients describes many techniques, but there is still a lack of knowledge about many important aspects, and further research and studies are needed to enable professionals to apply NTM in children.

#### **CONCLUSIONS**

Natural and traditional medicine is widely used in dental services, integrating favorably with therapeutic options for solving oral health problems and procedures that are part of dental treatments.

Hypnosis, acupuncture, therapeutic laser, ozone therapy, and phytotherapy are the most commonly used techniques in pediatric dentistry.

Hypnosis and acupuncture have shown favorable results in dental anxiety in children.

Laser therapy is beneficial in treating mucositis, orthodontics, and dentin hypersensitivity for diagnostic purposes, trauma management, teeth whitening, cold sores, gingivitis, surgery, and pericoronitis.

The application of ozone is a rapid, practical, easy, and especially painless procedure.

During dental treatment, phytotherapy can be used in pulpotomy, biofilm control, canker sores, and anxiety control.

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#### CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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