



NON-PHARMACOLOGICAL APPROACHES TO ANXIETY AND PAIN MANAGEMENT IN PEDIATRIC DENTISTRY

ÇOCUK DİŞ HEKİMLİĞİNDE FARMAKOLOJİK OLMAYAN KAYGI VE AĞRI YÖNETİMİ YAKLAŞIMLARI

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Abstract

Dental anxiety, often linked to pain perception, can lead to avoidance of dental treatments. Pain has both physiological and cognitive components, making non-pharmacological approaches essential in pediatric dentistry. Clinical hypnosis is a safe and effective psychological method for managing pain and dental anxiety. It has been successfully used to reduce dental phobias, control the gag reflex, and eliminate harmful oral habits like lip and finger sucking. This review highlights the clinical relevance of non-pharmacological strategies, particularly hypnosis and hypnotherapy, in pediatric dentistry by emphasizing their potential to reduce anxiety and pain, improve patient cooperation, and serve as effective adjuncts to conventional treatment approaches.

Keywords: Dental anxiety, pain management, pediatric dentistry, non-pharmacological techniques.

Özet

Dental anksiyete, genellikle ağrı algısıyla ilişkilidir ve diş tedavilerinden kaçınmaya yol açabilir. Ağrı, hem fizyolojik hem de bilişsel bileşenlere sahip olduğundan, çocuk diş hekimliğinde nonfarmakolojik yaklaşımlar önemli bir rol oynamaktadır. Klinik hipnoz, ağrı ve dental anksiyete yönetiminde güvenli ve etkili bir psikolojik yöntemdir. Dental fobilerin azaltılması, öğürme refleksinin kontrolü ve dudak ile parmak emme gibi zararlı alışkanlıkların giderilmesinde başarılı bir şekilde kullanılmaktadır. Bu derleme, non-farmakolojik stratejilerden hipnoz ve hipnoterapinin pedodontideki klinik önemini vurgulamakta; bu yöntemlerin anksiyete ve ağrıyı azaltma, hasta iş birliğini geliştirme ve konvansiyonel tedavi yaklaşımlarına etkili bir tamamlayıcı olarak hizmet etme potansiyellerine dikkat çekmektedir.

Anahtar Kelimeler: Dental anksiyete, ağrı yönetimi, çocuk diş hekimliği, nonfarmakolojik teknikler.

OVERVIEW / GENEL BAKIŞ

Dental anxiety is defined as fear, anxiety, or stress related to the dental environment. The fear of visiting the dentist may lead to the delay or avoidance of dental treatments (1, 2). The most important cause of dental fear and anxiety is pain. Although it is a physiological process, pain also has a strong cognitive component. There are two strategies for pain management: pharmacological and non-pharmacological (2). Non-pharmacological pain management strategies aim to help children cope with



pain and give them a sense of control or mastery over the situation. These strategies are categorized as behavioral-cognitive or bio-physical methods that focus the child's attention on something other than pain and prevent the transmission of pain impulses to the brain (3).

Non-pharmacological interventions can be useful in reducing psychological stress in patients undergoing dental procedures. Common behavioral guidance techniques, such as "tell-show-do" or positive reinforcement, are frequently used as an approach to anxious pediatric patients (4). One possible alternative to these techniques is the use of hypnosis during local anesthesia, which can improve patient cooperation in the presence of potential cooperation issues (5).

This review will provide information on hypnosis and hypnotherapy, which are non-pharmacological pain management and anxiety coping methods, and are considered to have a promising future in pediatric dentistry.

Nonpharmacological Pain Management

Pain management includes pharmacological and nonpharmacological approaches (6). Various nonpharmacological approaches are used to reduce procedural pain in children (7, 8). Studies on pain relief approaches have indicated that nonpharmacological methods can be as effective as pharmacological ones (9–12). Due to the many side effects of pharmacological methods, nonpharmacological approaches are preferred. The most commonly used nonpharmacological pain management methods are distraction, guided imagery, virtual reality glasses, acupuncture, counterstimulation, biofeedback, transcutaneous electrical nerve stimulation, relaxation and progressive muscle relaxation, and hypnotherapy (13).

Table 1. Classification of Non-Pharmacological Methods for Pain and Anxiety Management in Pediatric Dentistry.

Category	Methods
Behavioral / Cognitive	Distraction (toys, cards, audiovisual), Guided imagery, Relaxation, Progressive muscle relaxation
Technological	Virtual reality, Biofeedback, Transcutaneous electrical nerve stimulation (TENS)
Complementary / Alternative	Acupuncture, Hypnosis, Hypnotherapy
Supportive Techniques	Counterstimulation, Positive reinforcement, Modeling, Tell-Show-Do

Distraction

The goal of distraction is to shift the patient's mental focus to positive thoughts, acceptable environmental stimuli, or other sensory stimuli to alter the perception of unpleasant, discomforting procedures or to guide the patient from negative to positive behavioral states (4). There is strong evidence supporting the effectiveness of distraction techniques for needle-related pain and stress in



children and adolescents (15). There are two main types of distraction techniques: interactive and passive distraction. In interactive distraction methods, children are actively involved in the process of distraction during painful procedures. The most commonly used methods include balloon blowing, guided imagery, playing with interactive toys, and electronic games (13).

Guided Imagery

Guided imagery is a self-regulation therapy that uses imagination and storytelling to distract the child's attention from the procedure (16, 17). During the procedure, deep relaxation is induced through progressive muscle relaxation (PMR), and the child is encouraged to actively generate images that facilitate problem-solving (18). Guided imagery typically has three stages: relaxation, visualization, and positive suggestion. Patients may be allowed to choose their mental images, or they can be guided through scenarios set by the dentist. Guided imagery can be combined with relaxation techniques and cognitive-behavioral therapy (19). Studies have shown the effectiveness of guided imagery in treating distress and stress symptoms associated with chronic pain, social anxiety disorder, ADHD, and cancer pain (20).

Virtual Reality Glasses

Virtual reality (VR) glasses are one of the innovative modern methods used to distract patients from pain (21). VR technology, initially developed for gaming purposes, has expanded its applicability to healthcare and other sectors (22). Surrounding the patient with a virtual world allows their attention to be diverted from painful procedures (23). This distraction reduces pain perception by at least 33% compared to other cognitive distraction tools and results in an analgesic effect (24). Additionally, using VR has been shown to incorporate both visual and auditory scenes, leading to a positive emotional response and a comfortable dental experience (25).

Acupuncture

The term "acupuncture" is derived from the Latin words "acus" (needle) and "punctura" (pricking) (26). In acupuncture practice, sterile, fine, stainless steel needles are applied to specific point areas on the body for therapeutic effect (27). When performed by trained acupuncturists, acupuncture is reported to be a safe and effective treatment for both adult and pediatric patients (28). A systematic review conducted by the American Academy of Pediatrics in 2011, which examined pediatric acupuncture visits between June 2007 and September 2010, found that mild side effects, such as minor pain from needles, bruising, or lightheadedness, were observed during or after the procedure (29, 30).

Counterstimulation



According to the gate control theory of pain, A- β nerve fibers transmit information from vibrational receptors (Pacinian corpuscles and Meissner corpuscles) and skin touch receptors. These fibers stimulate inhibitory interneurons in the spinal cord, reducing the transmission of pain signals from A- δ and C fibers to the brain. Therefore, immediate stimulation of the injured area, such as by rubbing or pressure, can alleviate pain through counterstimulation. However, it has also been noted that vibration may have a neurophysiological effect in reducing pain transmission from peripheral pain receptors to the brain in addition to a placebo effect (31,32).

Recent studies suggest that distraction and counterstimulation, when used in combination, can be effective in reducing pain associated with intraoral anesthetic injections in pediatric patients. Although earlier reports primarily relied on empirical and anecdotal observations, contemporary evidence increasingly supports the clinical value of these techniques as adjunctive methods for pain management in pediatric dentistry (31,33).

Biofeedback

Biofeedback is defined as a mind-body technique, also known as applied psychophysiological feedback. Biofeedback therapies are used to measure and amplify physiological data, offering feedback based on this information to guide patients in regulating their biological systems. The primary goal of biofeedback is self-monitoring and using the acquired information to achieve self-regulation. Electromyographic biofeedback is commonly used to reduce muscle tone, and electroencephalographic biofeedback is used to condition brainwave activity, both aimed at reducing stress. Recent studies have shown that using biofeedback devices can reduce preoperative stress levels. For dental practice, specialized equipment and trained practitioners are required (20).

Transcutaneous Electrical Nerve Stimulation (TENS)

Transcutaneous electrical nerve stimulation (TENS) is a pain relief method that uses mild electrical currents and has been FDA-approved for pain management since 1972 (34). The mechanism of action of TENS is explained by the gate control theory of pain and the endogenous opioid theory. The TENS equipment consists of the main unit, electrodes, and lead wires. While TENS does not replace local anesthesia in clinical practice, it can be used as an analgesic during various dental procedures. Due to its analgesic and non-analgesic physiological effects, it has been noted to be useful for treating conditions affecting the maxillofacial region in both pediatric and adult patients (34).

Relaxation and Progressive Muscle Relaxation

Relaxation is the opposite of the stress response and, when practiced regularly, helps to lower stress and anxiety levels while assisting individuals in coping with stress symptoms. Physical relaxation leads to psychological well-being. Anxiety-inducing stimuli cause physical tension, increasing the perception of stress. Various relaxation techniques, such as Ost's applied relaxation,



Jacobsen's progressive muscle relaxation, functional relaxation, quick relaxation, autogenic relaxation, and relaxation response, are available. It is beneficial for dentists to familiarize themselves with these techniques and receive specialized training before applying them in practice (20).

Hypnosis and Hypnotherapy

Hypnosis is defined as a modified state of consciousness characterized by suggestibility and responsiveness. This approach, in which suggestions are used to reduce pain and anxiety and create changes in patients' perceptions, has been suggested to be beneficial in pediatric settings (35). Hypnosis and hypnotherapy are distinct concepts. Hypnosis has been described as a modified state of awareness with temporary beneficial effects such as reducing anxiety (36).

Hypnotherapy is a treatment method that involves specific therapeutic goals and techniques applied when a patient is in a hypnotic state. The terms hypnotist and hypnotherapist are also different and are often confused in clinical use. A hypnotist is a person with limited training in the field and no restrictions regarding patient groups. They may encounter complex situations during their practices (35,36).

A hypnotherapist, on the other hand, has the characteristics of a 'therapist' in their title. A child hypnotherapist is someone who has advanced training in one of the pediatric health fields and uses hypnotherapy techniques as part of a comprehensive approach to the diagnosis and treatment of certain disorders. In this context, hypnotherapy should not be used to treat an issue unless the individual is qualified to assess the problem and, if appropriate, refer to other specialists (35,37).

Hypnotherapy and Hypnosis in Children

Hypnosis and hypnotherapy, although closely related, denote distinct concepts. Hypnosis refers to an altered state of consciousness characterized by heightened suggestibility and focused attention, which can transiently reduce anxiety and discomfort. Hypnotherapy, in contrast, entails the structured clinical application of hypnosis, in which therapeutic techniques and goals are employed once the patient has entered a hypnotic state. If a child patient responds successfully to hypnotic induction and treatment techniques, the language used must be adapted to the child's level and interests, neither too complex nor too simple (36).

Hypnotherapy is expressed as the use of various hypnotic techniques in the field of psychotherapy. Hypnotherapeutic methods can be used in relationship or supportive therapies, behavior modification, psychoanalysis and dynamic therapies, or cognitive-behavioral therapy areas (4, 36).

Symptom-oriented techniques aim to eliminate, change, or alleviate specific physical or emotional symptoms. Dynamic techniques, on the other hand, aim to help the patient understand the problems that cause and sustain their issues, gain insight into underlying conflicts, and work on them,



facilitating maturation of their personality in broader cognitive, emotional, and social domains. In pediatric patients, symptom-oriented and supportive techniques are preferred over dynamic techniques. Some therapies for child patients may incorporate a combination of both methods (5, 36).

Hypnotherapy in children is indicated when the child responds to hypnotic induction methods, and when parents or other responsible adults accept the treatment plan, and if the use of hypnotherapy for the issue will not cause harm. Hypnotherapy is contraindicated if physical harm is expected to be caused to the patient, if it is being done solely for trial purposes without foundation, if it may increase psychological negative effects after or during the treatment, or if alternative treatment options are more appropriate, or if the issue requires treatment through another method (36).

Hypnotherapy and Hypnosis in Pediatric Dentistry

In pediatric dentistry, stress and anxiety are factors that must be constantly monitored among various aspects of children's emotional states (5). Fear of the unknown is a source of stress in many pediatric patient groups. Hypnosis is used as a therapeutic model in medical procedures, especially for pediatric patients with advanced diseases and a short life expectancy (4).

One of the most challenging aspects of pediatric dentistry is persuading the patient to accept treatment. Many child patients show severe anxiety and fear during dental procedures, especially during injections and local anesthesia applications. By using hypnosis to capture the patient's attention, it is possible to reduce anxiety and transform painful experiences (4).

The use of hypnosis in dentistry is referred to as "hypnodontics." Just as hypnotic techniques can be used in many medical fields, they can also be used in dentistry to reduce dental anxiety and phobias, ensure cooperation in orthodontic treatments, control pain in conservative treatments and extractions, support inhalation sedation, induce general anesthesia, and change undesirable oral habits such as thumb sucking, bruxism, and gagging (37).

There are no age-related contraindications for applying hypnosis in the pediatric field. However, it is more suitable for children who can understand and respond to suggestions. Therefore, it is often not applicable to children with mental disabilities (4).

Two main conditions must be met before applying hypnosis in a pediatric dental clinic setting: establishing a good relationship with the patient and determining the techniques based on the patient's age, cognitive development, and preferences. Additionally, hypnosis requires time and patience from a professional perspective, and if the patient does not want or resists, the expected result may not be achieved. Desired effects can be obtained with proper applications, but the procedures require time, and a quiet and calm environment must be provided (5).



SUMMARY / SONUÇ

The field of pediatric dentistry is one where the doctor-patient relationship is crucial for successful treatment. The practice of the profession, which simultaneously engages all five senses, can present challenges to pediatric dentists in establishing cooperation and providing treatment, especially for the pediatric patient group encountering dental procedures for the first time.

The use of hypnosis and other non-pharmacological methods, either alone or in combination, for fear of injections and pain, can create a comfort zone at the beginning of treatment in pediatric dentistry. Pediatric dentists who are knowledgeable about behavior management techniques and frequently apply them in routine dental procedures should also be adequately trained and informed about current non-pharmacological methods and hypnodontics, as this can increase cooperation in the dental chair.

In conclusion, non-pharmacological approaches, particularly hypnosis and hypnotherapy, represent valuable strategies for managing pain and anxiety in pediatric dentistry. These methods may enhance patient cooperation and reduce the need for pharmacological interventions. However, despite increasing interest, the evidence specifically focused on pediatric dental populations remains limited. Further well-designed clinical trials are needed to strengthen the evidence base and support the integration of these approaches into routine pediatric dental practice.

Conflict of Interest

Regarding this study, the authors declare that they have no conflicts of interest in relation to membership in scientific or medical committees, consultancy, expert witness work, employment with any company, ownership, or similar situations.

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