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# NON-PHARMACOLOGICAL METHODS FOR REDUCING DENTAL ANXIETY IN CHILDREN AND ADULTS: A NARRATIVE REVIEW

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**ABSTRACT**

Dental anxiety is a significant clinical problem that may lead to avoidance of dental care, deterioration of oral health, and reduced quality of life. The aim of this study was to present current evidence on non-pharmacological methods for reducing dental anxiety in children and adults and to evaluate the effectiveness of the most commonly used interventions. A narrative review was conducted using the PubMed database. Keywords and Medical Subject Headings (MeSH) related to dental anxiety and non-pharmacological interventions, including cognitive behavioral therapy, music therapy, hypnosis, virtual reality, and aromatherapy, were used in the search strategy. English-language publications published between 2016 and 2026 were included, comprising randomized controlled trials, clinical study, systematic reviews, meta-analyses, and narrative reviews. The findings indicate that the strongest scientific evidence supports cognitive behavioral therapy, which effectively reduces anxiety, decreases avoidance behaviors, and improves patient cooperation during dental treatment. Beneficial effects have also been reported for music therapy, hypnosis, virtual reality, and aromatherapy; however, for some of these interventions, the available evidence remains limited and findings are not always consistent. Non-pharmacological approaches may represent valuable adjuncts to the routine clinical management of dental anxiety. The choice of intervention should be tailored to the patient's age, severity of anxiety, and individual needs.

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**KEYWORDS**

Dental Anxiety, Non-pharmacological Methods, Cognitive Behavioral Therapy, Music Therapy, Virtual Reality, Hypnosis, Aromatherapy

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## Introduction

Dental anxiety is characterized by irrational fear, feelings of unease, and tension occurring before, during, or after dental treatment<sup>1</sup>. This phenomenon has been the subject of numerous scientific studies, which also distinguish its severe form, namely dental phobia, recognized as a specific type of phobia and classified as a separate disorder in the ICD-11<sup>2</sup>.

It is estimated that dental anxiety affects approximately 25% of the population<sup>3</sup>. Children and adolescents constitute a particularly vulnerable group, with around 9% experiencing this condition<sup>4</sup>. Dental anxiety is a multifactorial phenomenon. The most important contributing factors include negative or traumatic past experiences (especially during childhood), observation of anxious reactions among family members and peers, lack of understanding of dental procedures, and a negative image of dentists and dental treatment shaped by the media. Individual personality traits, such as neuroticism, as well as coping strategies for stress, also play a significant role. Additionally, anxiety may be triggered by sensory stimuli present in the dental office, such as the sound of drilling, vibrations experienced during procedures, and the sight of needles and rotary instruments<sup>1</sup>. A high level of anxiety often leads to avoidance of dental visits, which may result in serious health consequences. These include both oral diseases, such as untreated caries, periodontal disease, and tooth loss, as well as systemic conditions, including diabetes and an increased risk of cardiovascular diseases. Psychological aspects should also be considered, as individuals suffering from dental anxiety often experience feelings of shame, social withdrawal, increased levels of anxiety, and depressive symptoms<sup>5</sup>. To reduce anxiety, both pharmacological and non-pharmacological methods are used, either separately or in combination, depending on the individual needs of the patient. Pharmacological approaches include inhalation sedation with nitrous oxide, intravenous sedation, and oral sedation. Although these methods effectively reduce anxiety and facilitate dental treatment, they are associated with the risk of adverse effects and potential complications. Moreover, they require specialized equipment and increase treatment costs, which limits their availability in everyday dental practice<sup>3</sup>. The literature describes numerous non-pharmacological methods for reducing anxiety associated with dental treatment. The most commonly studied include cognitive behavioral therapy (CBT), hypnosis, music therapy, aromatherapy, and the use of virtual reality (VR)<sup>1,3,6</sup>. Cognitive behavioral therapy has attracted particular interest among researchers and, according to numerous clinical studies and

meta-analyses, demonstrates the highest effectiveness in reducing chronic dental anxiety<sup>5,7</sup>. Increasing evidence also indicates the positive effects of music therapy and hypnosis, especially in pediatric populations<sup>8,9</sup>. The aim of this literature review is to present current knowledge on non-pharmacological methods of reducing dental anxiety in children and adults and to evaluate the effectiveness of the most commonly used interventions based on clinical studies, systematic reviews, and meta-analyses.

## Methodology

A narrative review was conducted using the PubMed database to prepare this study. Combinations of keywords and Medical Subject Headings (MeSH) were applied, including *dental anxiety*, *non-pharmacological*, *cognitive behavioral therapy*, *music therapy*, *virtual reality*, *hypnosis* and *aromatherapy*. The search was performed using the Boolean operators AND and OR. English-language publications published between 2016 and 2026 were included in the analysis. The review considered randomized controlled trials (RCTs), clinical study, systematic reviews, meta-analyses, and narrative reviews addressing non-pharmacological methods of reducing dental anxiety. Publications focusing exclusively on pharmacological methods and articles without full-text access were excluded. Additionally, the reference lists of the included studies were analyzed to identify further publications meeting the established inclusion criteria.

## Cognitive Behavioral Therapy (CBT)

Cognitive behavioral therapy is a method used in the treatment of mental and emotional disorders. As one of the most extensively studied approaches, it is applied in the management of dental anxiety and dental phobia in both adults and children. Its aim is to identify distorted, maladaptive thoughts, beliefs, and the resulting behaviors related to dental treatment. CBT involves psychoeducation, cognitive restructuring, and gradual exposure to anxiety-provoking situations<sup>5,10</sup>. The effectiveness of CBT in reducing dental anxiety has been confirmed in numerous clinical studies and systematic reviews. Shahnavaz et al.<sup>4</sup> conducted a randomized controlled trial involving children and adolescents aged 7 to 18 years who met the criteria for dental anxiety. Participants were divided into two groups: one received cognitive behavioral therapy, while the other underwent standard pharmacological treatment, including various forms of sedation. The therapy consisted of 10 hours of sessions with a psychologist, conducted according to a standardized therapeutic program. Tolerance of dental procedures was assessed using the Behavioral Avoidance Test (BAT). Immediately after treatment, 64% of participants in the CBT group no longer met the diagnostic criteria for dental anxiety, compared to 18% in the control group. After one year, these values increased to 91% and 25%, respectively<sup>4</sup>. Additionally, an increase in self-efficacy was observed among patients receiving CBT. Further evidence supporting the effectiveness of CBT is provided by the study conducted by Tellez et al.<sup>11</sup>, who performed a randomized clinical trial in a group of 499 adult patients with high levels of dental anxiety. The authors developed an internet-based CBT program based on psychoeducation, cognitive restructuring, and exposure to dental procedures. The intervention consisted of a one-hour session during which participants created fear hierarchies, viewed exposure materials, and performed exercises based on motivational interviewing. After one year, using the Modified Dental Anxiety Scale (MDAS), a significant reduction in anxiety levels was observed in the intervention group. The authors emphasized that the effectiveness of the program was comparable regardless of whether support was provided by a psychologist or by appropriately trained medical personnel<sup>11</sup>. Findings from systematic reviews and meta-analyses also highlight the importance of CBT in reducing dental anxiety. Steenen et al.<sup>7</sup>, in a meta-analysis including 173 randomized controlled trials, demonstrated that CBT shows moderate but significant effectiveness in reducing chronic dental anxiety (trait anxiety) and is the best-documented psychological method for managing dental phobia and anxiety related to dental procedures. Similar conclusions were presented in the narrative review by Stan et al.<sup>5</sup>, which emphasized that CBT reduces anxiety, limits avoidance of dental visits, and improves patient cooperation during treatment. The authors also noted the dynamic development of new therapeutic approaches, such as internet-based CBT and the integration of CBT with virtual reality technologies. Matsuoka et al.<sup>10</sup> further indicated that CBT may also be useful in addressing other problems encountered in dental practice. The authors highlighted the need for increased training of dentists in basic CBT techniques, which could improve the accessibility of this form of therapy. Based on the available evidence, it can be concluded that cognitive behavioral therapy currently has the strongest scientific foundation among all non-pharmacological methods for reducing dental anxiety<sup>4,5,7,10,11</sup>. Its effectiveness has been demonstrated in both children and adults, with long-term benefits. CBT reduces anxiety levels, limits avoidance behaviors, and improves patient cooperation during dental treatment.

## Music Therapy

Music therapy is one of the most frequently studied non-pharmacological methods for reducing dental anxiety. Its mechanism of action is based on the influence of music on the nervous system, leading to a reduction in emotional tension, decreased stress levels, and improved patient well-being. Music may also distract patients from sensory stimuli associated with dental treatment and influence physiological parameters related to the stress response, such as heart rate, blood pressure, and salivary cortisol levels<sup>12,13</sup>. The effectiveness of music therapy has been evaluated in numerous clinical studies. Aravena et al.<sup>14</sup> conducted a randomized clinical trial involving 42 patients undergoing tooth extraction procedures. The study compared the effects of music at 432 Hz and 440 Hz with a control group that was not exposed to music. Anxiety levels were assessed using the Corah Dental Anxiety Scale and salivary cortisol measurements. The results showed that both 432 Hz and 440 Hz music reduced anxiety levels compared to the control group. However, no significant difference was found between the two frequencies in terms of subjective anxiety assessment. Differences between groups were more pronounced in salivary cortisol levels, with the lowest values observed in patients listening to 432 Hz music, while higher levels were recorded in both the 440 Hz group and the control group. This suggests that 432 Hz music may be more effective in modulating the physiological stress response, although its effect on perceived anxiety was comparable to that of 440 Hz music. In contrast, Wazzan et al.<sup>15</sup> reported different findings when assessing the effect of calming music on patients undergoing emergency endodontic treatment. In this randomized clinical trial, 46 patients participated; half listened to relaxing music prior to treatment, while the control group did not receive this intervention. Parameters such as dental anxiety levels, salivary cortisol concentration, systolic and diastolic blood pressure, heart rate, and body temperature were evaluated. Although lower anxiety levels and reduced physiological parameters were observed in the intervention group, none of these effects reached statistical significance ( $p > 0.05$ ). The authors suggested that the lack of significant findings might be due to the small sample size, mild to moderate baseline anxiety levels, and individual listening preferences. Important evidence is also provided by systematic reviews and meta-analyses. Van der Weijden et al.<sup>12</sup> analyzed 13 clinical studies assessing the effect of music on dental anxiety and selected physiological parameters. Patients in these studies underwent various dental procedures, including conservative treatment, endodontic therapy, and tooth extractions. The meta-analysis demonstrated a small but statistically significant reduction in anxiety among patients exposed to music during dental treatment, while no clear effect was observed for most physiological parameters. The authors concluded that music therapy may be a simple, inexpensive, and safe method supporting the reduction of dental anxiety. Tan et al.<sup>13</sup>, in their meta-analysis, provided strong evidence for the positive effects of music therapy. Their analysis included 18 randomized controlled trials, demonstrating significant reductions in physiological parameters such as heart rate and blood pressure, as well as decreased pain levels. Scores measured using dental anxiety scales, including MDAS, CFSS-DS, and S-AI, were also significantly lower. Additionally, patients exposed to music during dental procedures showed better cooperation and greater calmness. Kong et al.<sup>8</sup> further emphasized the importance of music therapy in pediatric populations. In a meta-analysis including 61 randomized controlled trials involving more than 6,000 children, the authors compared the effectiveness of various non-pharmacological interventions for reducing dental anxiety. The results indicated that music therapy was the most effective method, achieving the highest SUCRA ranking among all evaluated interventions. Despite some inconsistencies among individual studies, the majority of available evidence suggests a beneficial effect of music therapy on reducing dental anxiety. It is a non-invasive, low-cost, and easily implementable method in dental practice and is well accepted by patients. Current evidence indicates that music therapy may serve as an effective supportive tool in the management of dental anxiety in both children and adults<sup>8,12,13,14,15</sup>.

## Hypnosis

Hypnosis is one of the longest-established psychological methods used to reduce dental anxiety. It involves inducing a state of deep relaxation, focused attention, and increased suggestibility, which allows for modification of the perception of stressful stimuli and reduction of negative emotional responses associated with dental treatment. Through appropriate suggestions, it is possible to decrease anxiety, pain, and tension, as well as to enhance the patient's sense of safety and control during treatment<sup>9</sup>. In clinical practice, both classical hypnotherapy conducted by a therapist and self-hypnosis techniques or audio recordings containing relaxation suggestions are used<sup>9,16</sup>. The effectiveness of hypnosis in reducing dental anxiety has been evaluated in numerous clinical studies. One of the most comprehensive analyses was conducted by Wolf et al.<sup>9</sup> in a

systematic review and meta-analysis including 19 clinical studies published between 1979 and 2021. The authors assessed the effects of various forms of hypnosis on both dental anxiety levels and avoidance behaviors related to treatment. The results indicated that most studies reported a beneficial effect of hypnosis on anxiety reduction. However, significant methodological heterogeneity was noted, which limits the possibility of drawing definitive conclusions. Despite promising findings, the authors emphasized the need for further high-quality studies using standardized measurement tools. Additional evidence was provided by a randomized clinical trial conducted by Butrón-Téllez Girón et al.<sup>17</sup>, involving children aged 5–7 years undergoing pulpotomy. The study compared hypnosis with the traditional behavioral method “tell-show-do”. Children receiving hypnosis demonstrated significantly lower scores on the FLACC scale, assessing pain and distress, as well as lower heart rate and reduced skin conductance throughout the procedure. These findings suggest that hypnosis may effectively reduce both subjective anxiety and physiological stress responses during dental treatment. Similar results were reported by Ramírez-Carrasco et al.<sup>18</sup>, who evaluated the effectiveness of hypnosis during local anesthesia administration in children. The authors found that hypnotic techniques were associated with lower heart rate and improved patient cooperation during the procedure. Although not all parameters reached statistical significance, the results indicate that hypnosis may serve as a valuable supportive method for managing anxiety and pain during dental procedures. The role of hypnosis is also supported by the narrative review conducted by Venkiteswaran et al.<sup>16</sup>, which concluded that hypnosis can be effectively applied in both children and adults, contributing to reduced anxiety, improved cooperation, and decreased perioperative pain. Particularly promising results were observed with the use of pre-recorded hypnotic audio materials, which may increase the accessibility of this approach in clinical practice. Additional data were provided by the network meta-analysis conducted by Kong et al.<sup>8</sup>, including 61 randomized controlled trials on non-pharmacological methods of reducing dental anxiety in children. In this analysis, hypnosis was among the most effective interventions for reducing heart rate during dental treatment, achieving the highest SUCRA ranking for this parameter. These findings indicate a beneficial effect of hypnosis on the physiological stress response associated with dental treatment. Overall, available evidence suggests that hypnosis may be a valuable tool in reducing dental anxiety and improving patient comfort. Current findings indicate its positive impact on both subjective anxiety levels and selected physiological parameters related to stress response. Particularly favorable outcomes have been observed in pediatric populations, where hypnosis contributed to reduced anxiety and pain as well as improved cooperation. However, the available evidence remains limited due to the small number of high-quality studies and the heterogeneity of hypnotic techniques used. Therefore, further well-designed randomized controlled trials are needed to more precisely define the role of hypnosis among non-pharmacological methods of reducing dental anxiety<sup>9,16,17,18</sup>.

### **Virtual Reality (VR)**

Virtual reality (VR) is one of the more advanced non-pharmacological methods used in the reduction of dental anxiety. Its application involves the use of specialized headsets that allow patients to immerse themselves in a digital environment, thereby diverting attention from stimuli associated with dental treatment. The mechanism of action is primarily based on reducing focus on unpleasant experiences and on anxiety- and stress-inducing stimuli<sup>19,20</sup>. The effectiveness of virtual reality has been evaluated in numerous clinical studies. Hao et al.<sup>19</sup> presented the results of a network meta-analysis including 11 randomized controlled trials comparing the effects of music, audiovisual materials, and VR technology on anxiety associated with tooth extraction. The analysis demonstrated that the use of VR significantly reduced dental anxiety compared with control groups. At the same time, the authors observed that relaxing music achieved the greatest effectiveness among the analyzed methods, whereas virtual reality ranked second in terms of effectiveness. These findings indicate that VR may be a useful supportive method for reducing anxiety during dental procedures<sup>19</sup>. Additional valuable data were provided by the study conducted by Trusculescu et al.<sup>20</sup>, involving children undergoing simple dental procedures. During the intervention, participants used VR headsets displaying relaxing environments such as beaches, forests, mountain landscapes, and underwater scenes, accompanied by calming music. To assess the effectiveness of this method, the authors included objective stress indicators such as electrodermal activity (EDA) and blood volume pulse amplitude (BVP). The results showed a significant reduction in both parameters following the use of VR, which may indicate decreased activation of the sympathetic nervous system and reduced stress levels. An improvement in children’s behavior was also observed, reflected in greater calmness and better cooperation during treatment<sup>20</sup>. The findings suggest that VR may be particularly beneficial in pediatric populations, where distraction from dental procedures plays a

key role in anxiety control. An additional advantage of this method is the absence of adverse effects and the ability to easily tailor visual content to the patient's age and preferences <sup>20</sup>. Despite promising results, the number of studies on the use of virtual reality in dentistry remains limited. However, available evidence suggests that VR may serve as an effective supportive tool for reducing dental anxiety, particularly in children and in patients experiencing high levels of stress prior to treatment. Further clinical studies are needed to evaluate the long-term effectiveness of this method <sup>19,20</sup>.

### **Aromatherapy**

Aromatherapy utilizes the effects of natural essential oils to induce relaxation and reduce emotional tension. Its mechanism of action is primarily associated with the influence of olfactory stimuli on the limbic system, which plays a key role in the regulation of emotions, memory, and stress responses. In dental practice, the most commonly used essential oils include lavender, orange, bergamot, and vanilla, which are diffused in the waiting area or dental office prior to treatment <sup>21</sup>. The effectiveness of aromatherapy in reducing tension and anxiety associated with dental treatment has been evaluated in several clinical studies, the results of which were summarized by Purohit et al. <sup>21</sup> in a meta-analysis including six randomized controlled trials. The authors analyzed the impact of this method on the emotional state of patients undergoing dental procedures. The findings demonstrated a statistically significant reduction in anxiety levels in groups receiving aromatherapy compared to control groups. The analysis also revealed very small differences between the results of individual studies, indicating a high level of consistency. The authors emphasized that aromatherapy may represent a simple, safe, and easy-to-implement method supporting the reduction of stress and anxiety related to dental visits. Unlike many other psychological approaches, it does not require specialized staff training or active patient participation. An additional advantage is its low cost and the possibility of application both in the waiting area and during the procedure itself <sup>21</sup>. However, it should be noted that the number of studies on the use of aromatherapy in dentistry remains limited. Furthermore, different studies have used various types of essential oils, methods of administration, and tools for assessing anxiety levels, which makes direct comparison of results difficult and limits the ability to formulate clear clinical recommendations <sup>21</sup>. Available evidence suggests that aromatherapy may be an effective supportive method for reducing anxiety in patients undergoing dental treatment. Due to its simplicity, safety, and low cost, it may serve as a valuable complement to other non-pharmacological methods of stress reduction. At the same time, further clinical studies are needed to determine which essential oils and application methods are the most effective in dental practice <sup>21</sup>.

### **Discussion**

The aim of this narrative review was to present current knowledge on non-pharmacological methods for reducing dental anxiety in children and adults and to compare the effectiveness of the most commonly used interventions. The analysis of available clinical studies, systematic reviews, and meta-analyses indicates that individual methods differ both in the strength of scientific evidence and in their applicability in clinical practice (Table 1).

**Table 1. Comparison of Non-Pharmacological Methods for Reducing Dental Anxiety**

| Method                                    | Strength of Scientific Evidence                                                                                       | Key Studies                                                                    | Main Effects                                                                                                                                                                                                    | Limitations                                                                                                 |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Cognitive Behavioral Therapy (CBT)</b> | Strongest evidence – supported by numerous randomized controlled trials (RCTs) and meta-analyses                      | Shahnavaz i wsp.; Tellez i wsp.; Steenen i wsp.                                | Long-term reduction of dental anxiety (up to 91% of patients no longer met diagnostic criteria after one year), reduced avoidance of dental treatment, improved patient cooperation in both children and adults | Limited availability; requires trained professionals                                                        |
| <b>Music Therapy</b>                      | Moderate to strong evidence – supported by multiple RCTs and meta-analyses, although findings are partly inconsistent | Aravena i wsp.; Wazzan i wsp.; van der Weijden i wsp.; Tan i wsp.; Kong i wsp. | Reduced anxiety and physiological parameters (heart rate, blood pressure, cortisol levels); highest SUCRA ranking among children                                                                                | Inconsistent findings regarding physiological outcomes                                                      |
| <b>Hypnosis</b>                           | Promising evidence, although limited by methodological quality                                                        | Wolf i wsp.; Butrón-Téllez Girón i wsp.; Ramírez-Carrasco i wsp.; Kong i wsp.  | Reduced anxiety and physiological parameters (heart rate, blood pressure, cortisol levels); highest SUCRA ranking among children                                                                                | Inconsistent findings regarding physiological outcomes                                                      |
| <b>Virtual Reality (VR)</b>               | Growing evidence, although the number of studies remains limited                                                      | Hao i wsp.; Trusculescu i wsp.                                                 | Effective distraction, reduced sympathetic nervous system activity (EDA, BVP), improved behaviour, mainly in paediatric patients                                                                                | Limited number of studies; less effective than music therapy in direct comparisons                          |
| <b>Aromatherapy</b>                       | Weakest evidence – only a small number of studies available                                                           | Purohit i wsp.                                                                 | Statistically significant reduction in anxiety; simple, inexpensive, and easy to implement                                                                                                                      | Very limited number of studies; lack of standardization regarding essential oils and administration methods |

Among all the discussed interventions, cognitive behavioral therapy (CBT) has the strongest scientific foundation. Its effectiveness has been confirmed in randomized clinical trials as well as in meta-analyses including a large number of studies. CBT effectively reduces anxiety levels, limits avoidance behaviors, and improves patient cooperation during dental treatment. Importantly, these effects have been observed in both children and adults, and the benefits are maintained over long-term follow-up. Unlike most other methods, CBT addresses not only the current experience of anxiety but also its cognitive and behavioral causes, which may explain the durability of its effects. However, its limitations include lower availability and the need for appropriately trained personnel. Music therapy also demonstrates significant effectiveness. The results of most analyses indicate that its use contributes to a reduction in anxiety levels and improves patient comfort during treatment. Some studies have additionally reported a beneficial effect of music on physiological parameters related to the stress response, such as heart rate, blood pressure, and cortisol levels. However, it should be emphasized that the findings of individual meta-analyses are not entirely consistent. Some authors confirm the positive impact of music therapy on both subjective anxiety levels and physiological indicators, while others primarily report improvements in patient well-being without clear evidence of an effect on physiological stress responses. Despite these discrepancies, music therapy appears to be one of the simplest and most accessible methods supporting the reduction of dental anxiety.

Promising results have also been obtained for hypnosis. Clinical studies indicate that it may effectively reduce anxiety, pain, and physiological arousal during dental treatment. Particularly favorable outcomes have been observed in pediatric populations. However, the available studies are characterized by considerable methodological heterogeneity regarding both the hypnotic techniques used and the tools for assessing effectiveness. This limits the possibility of drawing definitive conclusions and highlights the need for further research. Growing interest in the literature also concerns the use of virtual reality in reducing dental anxiety. Available evidence suggests that VR can effectively distract patients from dental procedures and reduce stress responses associated with treatment. Particularly beneficial effects have been reported in children, for whom immersive virtual environments provide an attractive form of distraction. Despite promising findings, the number of studies in this area remains limited, which justifies the need for further research on the effectiveness of this method. The least amount of scientific evidence was found for aromatherapy. Although available studies and meta-analyses suggest a beneficial effect of essential oils on reducing dental anxiety, the number of publications remains relatively small. Therefore, aromatherapy should currently be considered a supportive method used as a complement to other anxiety-reduction techniques. The results of this review indicate that there is no single universal method suitable for all patients. The effectiveness of individual interventions depends on the patient's age, severity of anxiety, previous experiences related to dental treatment, and individual preferences.

## Conclusions

The narrative review indicates that non-pharmacological methods for reducing dental anxiety can effectively decrease stress levels and improve patient comfort during dental treatment. The strongest scientific evidence supports cognitive behavioral therapy (CBT), whose effectiveness has been confirmed in both children and adults. Beneficial effects have also been demonstrated for music therapy, hypnosis, virtual reality, and aromatherapy; however, for some of these interventions, the available evidence remains limited. The choice of an appropriate intervention should be tailored to the individual patient's needs, age, and severity of dental anxiety. Combining different non-pharmacological approaches may further enhance treatment effectiveness and improve patient cooperation during dental procedures.

**Author's contribution:** Research concept and design – Zuzanna Kucia, Gabriela Pilch, Agnieszka Ciepiela

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**Data analysis and interpretation** – Zuzanna Kucia, Michał Zemowski, Jakub Sagan, Małgorzata Berowska,

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**Critical review of the article** – Michał Zemowski, Jakub Sagan, Małgorzata Berowska

**Supervision, project administration** – Zuzanna Kucia

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