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Ana Maeli Aguilar Flores
Master's in Sciences Student,
Universidad Autonoma de Nuevo
Leon, Facultad de Odontologia,
Monterrey, Nuevo Leon, 64460 ZIP,
Mexico

Mariela Rocha Gómez
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
64460 ZIP, Mexico

Gustavo Israel Martínez González
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
64460 ZIP, Mexico

Rene Hernandez Delgadillo
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
64460 ZIP, Mexico

Sergio Nakagoshi Enriquez
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
64460 ZIP, Mexico

**Maria Argelia Akemi Nakagoshi
Cepeda**
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
64460 ZIP, Mexico

Aida De Los Santos Ruiz
Dentistry Student, Universidad
Autonoma de Nuevo Leon, Facultad
de Odontologia, Monterrey, Nuevo
Leon, 64460 ZIP, Mexico

Juan Manuel Solis Soto
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
64460 ZIP, Mexico

Corresponding Author:
Ana Maeli Aguilar Flores
Master's in Sciences Student,
Universidad Autonoma de Nuevo
Leon, Facultad de Odontologia,
Monterrey, Nuevo Leon, 64460 ZIP,
Mexico

Distraction techniques in children with dental fear and anxiety

Ana Maeli Aguilar Flores, Mariela Rocha Gómez, Gustavo Israel Martínez González, Rene Hernandez Delgadillo, Sergio Nakagoshi Enriquez, Maria Argelia Akemi Nakagoshi Cepeda, Aida De Los Santos Ruiz and Juan Manuel Solis Soto

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Abstract

Introduction: Children with dental fear and anxiety try all means to avoid or delay dental treatment, and it results in the deterioration of their oral health. Distraction techniques are strategies that overload the patient's limited attention span, diverting their attention from unpleasant procedures and thus being a safe strategy.

Objective: To analyze the most recent literature on distraction techniques in children with fear and anxiety, such as music, audiovisual distraction, animal-assisted therapy and sensorially adapted dental environments, and their effectiveness.

Methodology: A comprehensive search was performed in PubMed using keywords such as dental anxiety, dental fear, distraction, and children.

Results: The music therapy technique in most cases proves to be effective in reducing anxiety and pain during clinical procedures in children; audiovisual distraction using virtual reality goggles has proved to be a useful distraction tool to reduce anxiety and fear during dental treatment; animal-assisted therapy has shown to be a promising technique in the management of dental fear and anxiety, but needs to be studied more rigorously to corroborate its efficacy; and the sensory adapted environment has very little information, however, very good results have been observed in its use for the management of dental fear and anxiety in children and its benefits in children with special abilities.

Conclusion: The available studies show that the distraction techniques mentioned can be effective during dental treatment for the management of dental fear and anxiety in children, including those with special abilities. However, the certainty of the evidence for them is very low, so more future studies and research comparing the different distraction techniques among children of different age groups are recommended.

Keywords: Dental anxiety, dental fear, distraction, and children

1. Introduction

Dental fear and anxiety (DFA) has a negative impact on a child's oral health-related quality of life, and these patients often require more time for dental treatment [1]. Therefore, it is an important issue in dentistry, especially with children [2]. Dental fear generally refers to an unpleasant emotional reaction to specific threatening stimuli that occur in situations associated with dental treatment, while dental anxiety is an excessive and unreasonable negative emotional state experienced by dental patients. These psychological states consist of the apprehension that something terrible is going to happen in connection with dental treatment. Both terms are often used interchangeably in the scientific literature but represent different progressive degrees of the same psychological condition [1, 3].

The reported prevalence of DFA among children and adolescents in different countries ranged from 5 to 33% [3, 4, 5]. Children with DFA often try all means to avoid or delay dental treatment, resulting in the deterioration of their oral health [6]. They also demonstrate poor cooperation during dental visits, which jeopardizes treatment outcomes, creates occupational stress for dental staff, and causes discord between dental professionals and the children's parents [7].

Distraction techniques are anxiety-reducing strategies that overload the patient's limited

attention span, thus diverting their attention from unpleasant procedures (noxious stimuli) [8]. These can be active or passive. Active techniques involve activities that require the direct participation of the child, such as the use of toys and games. Passive techniques are based on the use of music and videos, etc. and do not require the child to participate directly [9, 10].

Distraction seems to be a safe strategy that can have a positive impact on children's dental fear and anxiety, thus improving the quality of dental care. Many studies have been conducted on distraction methods in children with DFA, however, few literature reviews have collected scientific evidence on the efficacy of rarely used distraction techniques during dental treatment so far. Therefore, the aim is to review the literature on dental fear and anxiety and provide the most recent information on the management of techniques in children such as music, audiovisual distraction, animal-assisted therapy and sensory-adapted dental environments, as well as their effectiveness.

2. Materials and methods (Times New Roman, 12, Bold)

Articles on the subject published through the PubMed, SCOPUS and Google Scholar databases were analyzed, with emphasis on the last 5 years. The quality of the articles was evaluated using PRISMA guidelines, i.e., identification, review, choice and inclusion. The quality of the reviews was assessed using the measurement tool for evaluating systematic reviews (AMSTAR-2) [11]. The search was performed using Boolean logical operators AND, OR and NOT. It was realized with the words "Dental fear", "anxiety", "music distraction", "audiovisual distraction", "animal-assisted therapy". The keywords were used individually, as well as each of them related to each other.

3. Results & Discussion

3.1 Music

The management of the pediatric patient in the dental clinic is a challenge for the pediatric dentist. In addition to various pharmacological techniques, treatment of pediatric patients by distraction with music has been introduced as an alternative. Music has been noted to be effective in reducing anxiety and pain in children undergoing medical and dental procedures, so it can be considered an adjuvant therapy in clinical situations that produce pain or anxiety [12], as it can have a biological and psychological impact on the child. Therefore, it has been used effectively as an aid to moderate anxiety in the clinical setting [13]. Music has been shown to help calm children by reducing the heart rate and respiratory rate during dental intervention [14]. Similarly, music therapy has been shown to be effective as a distraction technique in children with intellectual disabilities [15]. In addition, music therapy when combined with other modalities may be more effective than when presented alone and may reduce the amount of pharmacological agents needed to control pain and anxiety [16]. For example, both music distraction and aromatherapy with orange essential oil are effective in managing anxiety, and together they have a much better outcome in the dental office of pediatric patients, improving their cooperation [17]. However, cases have also been shown where music did not produce a reduction in pain, anxiety or the child's behavior during the procedure [18], but the patients still enjoyed listening to music during their office visits [19]. Thus, it can be concluded that music is a non-pharmacological alternative that reduces anxiety levels in children during dental treatment [20]. The technique of music therapy in most cases is effective

in reducing anxiety and pain during clinical procedures in children, however, the existing information is still limited, and in some situations the results are not significant. Thus, music therapy should be applied more frequently in the dental office in order to have a more accurate criterion of its results and benefits.

3.2 Audiovisual Diversion

Audiovisual distraction (AVD) is an effective distraction tool for young children during dental treatment, regardless of the child's subjective expression of pain [21]. It has been shown to be a beneficial technique for reducing the perception of anxiety and improving children's cooperation during dental treatment and has been suggested for use when children require treatment with local anesthesia [22]. The use of audiovisual or virtual reality glasses offer an effective distraction tool to alleviate discomfort and distress arising during dental restorative procedures [20], observing that children wearing them during treatment present not only less anxiety, but also more positive responses after injection with local anesthesia [24], thus proving to be an effective tool to improve behavior during caries removal and reduce children's perception of pain [25]. The positive effects of AVD on anxiety in children are attributed to the blocking of children's visual fields and, as a result, to a successful distraction technique and an improvement of children's physiological parameters [26]. AVD was found to be more able to reduce anxiety than other techniques such as "Tell, Show and Do", although the combination of both techniques had an additive effect in reducing the level of anxiety and proved to be more beneficial [27]. In addition, this technique has been shown to be effective in the management of children with autism spectrum disorder during noninvasive preventive dental procedures [28]. However, this distraction technique using virtual reality goggles is not as useful in managing the dental office behavior of children with Down syndrome [29]. Therefore, in today's digitized world, AVD using virtual reality goggles has proven to be a useful distraction tool to decrease anxiety and fears during dental treatment in most children. Besides, it allows the dentist to perform procedures with less stress and greater agility. Therefore, this technique can be used routinely in dental practice as a complement to other behavior management techniques.

3.3 Animal-Assisted Therapy

Animal-assisted therapy (AAT) is an effective strategy for behavioral management of children of today's generations and older non-pharmacological behavioral management techniques may need to be redefined. It could also be an integral part of a child's first dental visit, treatment of children with special needs, dental care for orphanages and also in various dental specialties [30]. This may prove to be a good technique for behavior management if more parents become informed about this technique. The dog is one of the most recommended pets for AAT, and the therapy pet should be similar to the domestic pet [31]. It has been shown that a 15-minute exposure with the puppy in the office waiting area can reduce the anxiety level. Therefore, it has shown to be a promising method for anxiety management in the dental practice [32]. In addition, current evidence shows that AAT can alleviate pain in children to some extent during dental treatments [33] and also noted improvement in the patient's assessment of the visit experience, showing decreased heart rate in patients when taken in the middle of dental treatment [34]. The findings support that therapy dogs in pediatric

dentistry are a feasible animal-assisted intervention in the pediatric dental clinic, providing a generalizable model to other medical settings and experiences that may provoke anticipatory anxiety and fear in children^[35], as high levels of satisfaction and relaxation have been observed among pediatric users to the use of AAT^[36]. It should also not be forgotten that risks to human health and safety in the presence of therapy dogs in clinics are present, but are low if dental clinical staff and dog handlers comply with best practices^[37]. Still, AAT shows promise as a distraction technique in the management of dental fear and anxiety, but should be studied more rigorously to corroborate its efficacy in cooperative behavior in children for dental procedures and the safety of its use, as knowledge of its use is very limited.

3.4 Sensory Adapted Dental Environment (SADE)

The sensory adapted dental environment (SADE) shows utility and positive treatment effects. The use of this type of dental environment has the potential to not only improve dental care for children with autism spectrum disorders (ASD), but also for children with other disabilities and children with typically developing dental fear and anxiety and/or sensory processing difficulties^[38]. It has been shown that behavioral and psychophysiological measures of relaxation were significantly improved with the use of SADE compared to a conventional dental environment. Thus, it serves as a practical and effective alternative in dental treatment^[39], decreasing anxiety for both the patient and the dental provider. It reduces the perception of noxious smells, noises and touch, and allows the child to better tolerate procedures for more comprehensive oral care and to improve overall health and quality of life^[40]. In children with special needs, SADE also effectively improves oral health management in terms of physiological changes, pain, sensory discomfort^[41], anxiety and challenging behaviors during clinical care^[42], with greater benefit observed in sensory adapted environments, indicating the importance of the environment in determining the comfort level of all children^[43]. SADE may be associated with improved behavior in children with developmental disabilities so many parents agree to its application in their children's dental visits^[44]. However, it has been noted that the waiting room environment is not as useful in reducing children's anxiety before dental treatment^[45]. There is very little information on the SADE, but within the little information available, very good benefits and results have been observed in its use for the management of dental fear and anxiety in children, and it was shown to be effective in children with ASD, even so, more research is needed to determine the effectiveness of multisensory environments so that the doctor can introduce them into the clinical setting. Children's dental anxiety can be reduced by avoiding emergency treatment, scheduling routine dental visits, and decreasing waiting time.

4. Conclusions

Dental fear and anxiety are a common problem in children worldwide. The studies available to date show that the various distraction techniques mentioned in this article can be in most cases effective in managing dental fear and anxiety in children and adolescents, including those with special abilities, during dental treatment. However, the evidence of their efficacy is very low, so more future studies and research comparing the different distraction techniques among children of different age groups is recommended in order to have a more accurate knowledge of them and thus be able to

implement them in the dental office.

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