



Efficacy of using audio visual distraction methods to reduce fear and anxiety during dental treatment in Paediatric dentistry

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Abstract

One of the most common reasons of dental care avoidance is anxiety, particularly in children. Therefore, it is vital to apply behavior management techniques efficiently during dental treatment. Distraction is a technique used to divert a patient's attention from what may be perceived as an unpleasant dental procedure. Distraction techniques include: telling stories, music, audiovisual cartoons on a television, and more recently, audiovisual video eyeglasses. Audio visual distraction method considered as one of the most common effective techniques used in paediatric dentistry because it can help children to reduce fear and feel less anxious during dental procedures.

Keywords: Dental anxiety, fear, audiovisual distraction, Paediatric dentistry.

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1. Introduction

One of the most common causes of dental care avoidance in children is anxiety, which can make it more difficult to provide dental treatment. Paediatric patients are typically reported to be worried due to unfamiliar dental equipment. Every dental operatory contains stimuli that can readily elicit and cause anxiety, including bright lights, loud noises, and odd surroundings. There is a clear relationship between dental anxiety in children and successful dental procedures. To gain the trust of children during dental treatment, it is vital to alter or influence their behavior patterns [1]. Distraction techniques help paediatric patients cope with fear and anxiety by deflecting their focus from unpleasant processes. Audio-visual distraction is a method of passively distracting two types of sensations: hearing and seeing. It's considered as one of the most common effective methods used in paediatric dentistry clinic to reduce fear and anxiety [2].

2. Fear and anxiety

Dental anxiety is an extreme and irrational negative emotional state that dental patients experience, whereas dental fear generally refers to an unpleasant emotional reaction to particular hazardous stimuli that occur in settings linked with dental treatment. Although the two phrases are frequently used synonymously in scientific literature, they refer to distinct stages of the same psychological disorder [2]. A child's quality of life related to oral health is negatively impacted by dental fear and anxiety (DFA), and Alduwayghiri, 2024

these patients frequently need longer time for dental treatment. As a result, it is a crucial topic in paediatric dentistry [2]. Worldwide, between 6 and 15% of people have severe dental anxiety [3-4]. There are two types of anxiety: preoperative anxiety and separation anxiety. Preoperative anxiety in children can stem from a variety of factors, including separation anxiety, being in an unfamiliar setting with non-known people, feeling out of control, and dread of harm. A number of issues that could arise before or after dental procedures are linked to preoperative anxiety. It is linked to reduced compliance with local anaesthesia induction. Numerous pharmacological and nonpharmacologic behavior management techniques have been studied in an effort to address the effects of preoperative anxiety [4]. Anxiety scales, such as Modified Child Dental Anxiety Scale (MCDAS), are a valid and effective way to measure how children react to dental stress. When evaluating children's internal stress, autonomic nerve activity measurement might be very helpful [1,5]. Assessing physiological function is an excellent way to gauge a patient's level of anxiety prior to receiving dental care. Heart rate, blood pressure, and physiological markers (SBP, PR, and SpO₂) can all be utilized as accurate gauges of anxiety [1]. The management of dental anxiety in children during necessitates the application of behavior management approaches. There may be a beneficial effect when two or more strategies are applied concurrently, such as distraction and "tell show do" [1].

Dental practitioners or paediatric dentist can employ a variety of strategies, including tell-show-do, desensitization, modelling, distraction and many other strategies to help anxious patients [5].

3. Distraction method

Distraction techniques including music, telling stories, watching videos or cartoon, using virtual reality glasses, and it can effectively lower paediatric patients' anxiety levels during dental treatment, according to a systemic review by Al-Jaloud et al., (2022) [9]. By overloading the patient's limited attention span and deflecting their focus from unpleasant processes, distraction methods help patients cope with dental anxiety. They can be either passive or active. Active methods include things like using games and toys that need the child to participate directly. The use of music or watching cartoons on a television for example, is the foundation of passive approaches, which don't need the child to actively participate [2]. The technique of distraction entails the best possible level of emotional engagement and patient attention [6]. Distraction appears to be a risk-free method that can help reduce paediatric patients' anxiety, enhancing the standard of dental care [2]. It is a non-invasive strategy that modifies a child's discomfort in order to achieve high-quality and successful dental treatment [7-8]. It is assumed that "the experience of pain has a strong psychological component" in order for distraction therapy to be successful. As a tool for behavior counselling, distraction is defined by the American Academy of Paediatric Dentistry (AAPD) as "the strategy of diverting the patient's attention from what may be perceived as an unpleasant activity" [9]. The means of diversion that tangentially encourages pa behavior are called distraction aids. It helps patients feel less anxious and more comfortable during their dental visit. Cognitive behavioral therapy teaches coping skills, including distraction methods [10]. There are three key 'distraction' approaches: 1. Cognitive distraction, 2. Behavioral distraction, 3. Physiological distraction. Reading aloud and voice mastery (e.g., reacting only to friendly voices or narrating hallucinations out loud) are examples of cognitive distractions [11].

4. Audio visual distraction

Audiovisual distraction is a method of passively distracting two types of sensations: hearing and seeing. It's considered as one of the most common effective methods used in paediatric dentistry clinics to reduce fear and anxiety [2]. Positive attitudes and happy recollections of seeing the dentist are fostered by the usage of Audio-Visual Distraction. When a child exhibits negative behavior or refuses treatment, the Audio-Visual Distraction is not advised [1]. The TV screen will provide a multisensory distraction that children can manage while also giving them the impression that they are in a familiar environment. Because their focus will be on the TV screen, the children will also be able to block out unpleasant dental sounds, such as the sound of the hand piece. According to Prabhakar et al., (2007), the audio distraction strategy alone is not as effective as the AV distraction approach [12]. Cartoon watching is an example of audiovisual (AV) distraction, which is a passive strategy made up of two senses: visual and aural [13].

Audio Visual Distraction is a cheap and easy procedure that doesn't interfere with dental treatment. This method permits communication between the child and the paediatric dentist. Children generally accept this kind of distraction, and it's simple to apply [14]. One of the behavior management strategies that is most frequently taught is the "tell show do" strategy. The foundation of it is learning theory. It requires that the child be fully informed before any surgery is performed and that a simulator be used to show the youngster exactly what will happen before the procedure is started. Since it is comfortable for the patient as well as the dentist, the "tell show do" is the method most frequently employed in paediatric dentistry. Khandelwal et al. examined the decrease in anxiety levels among patients receiving dental care during their initial appointment. They came to the conclusion that "tell show do" technique was not as effective at reducing anxiety as the Audio-Visual Distraction. Combining "tell show do" with Audio Visual Distraction reduced anxiety levels in an additive manner, and this showed to be more effective [1]. According to John Burton's definition from 1955, audio-visual aids are any sensory images or things that encourage, excite, and reinforce learning. Kinder S. James asserts that the use of audio-visual aids can enhance the accuracy, realism, and dynamic nature of the learning process [15]. The best motives and clearest visuals are provided, as well as the ability for audio-visual aids to serve as an instructional role on their own, spark group interest, make teaching more efficient, and make teaching-learning more explicit. A number of authors have categorized audio-visual aids according to the type of projection that they employ. Audio-visual aids go into one of two categories: Audio aids, materials that can be heard, such as a radio or listening to music or any sound clips, are referred to as "audio materials". Visual aids, it helps in visualizing things. It has two types: a) Not requiring projection: print material, exhibits, poster, etc. b) Requiring projector: slides, film strips, OHP, etc. Audio-visual aids, can be heard and seen at the same time such as; Projected aids, television, films as well as virtual reality glasses. Virtual reality glasses, or VR, refers to audiovisual video glasses, which are human-computer interfaces that enable dynamic user interaction with the computing environment. Virtual reality (VR) employs complex devices such a wide-field head mount, 3D displays (HMDs), and motion detection systems that measure the location of the user's hands and head in contrast to less sophisticated audiovisual distraction. Because it projects visuals in front of the user's eyes and uses real-world blocking (visual, auditory, or both) impulses depending on the model utilized, such a system can outperform classical distraction [17]. Dental clinics have had success calming anxious young patients by using multimedia distraction techniques. With its definition as "a human-computer interface that lets the user engage interactively with the computer-generated world," virtual reality (VR) distraction is a cutting-edge medical tool that could help with patient behavior control [9]. A tried-and-true art-based health profession, music therapy addresses clients' physical, emotional, cognitive, and social needs through therapeutic relationships and music. There are two variations of this pain-relieving technique: Active and Passive.

In active music therapy, a music therapist participates in active communication with patients, while in passive music

therapy, patients merely listen to music on their own [16,18]. It has been shown to reduce children's heart and respiration rates, which helps them feel more comfortable during dental procedures. Another method for lowering stress is white noise, sometimes known as audio analgesia. It provides something to focus on while interacting with the dentist during a period of time [10]. According to Ronald Melzack and Patrick Wall back in 1965, pain signals are transmitted from the site of injury through synapses and nerve receptors in the spinal cord to the brain. The gate is opened for auditory input when there are two sensory stimuli present, which increases audio and visual stimulation and reduces pain perception. Thus, in this instance, the audio and visual stimulation blocks the Central Nervous System (CNS) from receiving pain signals. Distraction is a second mechanism, any method that can deflect attention from unpleasant stimuli, such the sound of a handpiece. One way to help a patient cope with damaging stimuli is to distract them with pleasurable ones. By using distraction strategies, children can refocus their attention on more enjoyable stimuli instead of ones that cause anxiety [16]. In order to manage dental anxiety, Mishra et al., (2019) examined auditory and audio-visual distraction strategies. They came to the conclusion that the audiovisual distraction group had a lower Venham's anxiety scale [22]. Based on their research, Abd Hamid et al., (2018) came to the conclusion that interactive games and cartoons, as well as other forms of audiovisual diversion, can effectively lower anxiety in paediatric dentistry patients [5]. Based on their research, Barreiros et al., (2018) came to the conclusion that children's dental anxiety can be effectively managed with the help of audiovisual distraction [14]. According to the findings of Muhammad et al., (2022), the audiovisual distraction method provides a useful diversion from pain and unpleasantness that may occur after the administration of local anaesthesia during dental treatment [17]. In contrast to audiovisual (AV) and conventional methods, Kumprasert et al., (2021) found that video games were the most effective method to minimize disruptive behavior during local anaesthetic injection [13]. Another study found that watching videos is a money-efficient method for reducing fear and dental anxiety [4].

5. Conclusions

Fear and anxiety related to dentistry are prevalent issues among paediatric patients globally. Distraction techniques can help them feel less anxious during dental procedures. Audio-visual distraction method has proven to be more successful than other conventional distraction methods. Using this type of distraction helps to reduce fear and make children feel less anxious during dental procedures.

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