



Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/19288

DOI URL: <http://dx.doi.org/10.21474/IJAR01/19288>



RESEARCH ARTICLE

INNOVATIVE DISTRACTION TECHNIQUES TO MANAGE ANXIETY IN PAEDIATRIC DENTISTRY

Dr. Avani S., Dr. Deepti Jawa, Dr. Shipra Jaidka, Dr. Ashjan Ashraf Batha, Dr. Ashish Kumar and Dr. Anaswara S.

Manuscript Info

Manuscript History

Received: 15 June 2024

Final Accepted: 17 July 2024

Published: August 2024

Key words:-

Distraction, Anxiety, Emotional Freedom Technique, Hypnosis, Glove Puppet, Anxiety Management

Abstract

Distraction techniques in pediatric dentistry are crucial for managing anxiety and fear in young patients, ensuring a positive dental experience. These techniques aim to create a calm and supportive environment, promoting positive dental experiences for children and reducing fear associated with dental visits. Children frequently experience anxiety and apprehension when visiting the dentist, which can impact their cooperation and overall experience. Distraction techniques have emerged as valuable tools to divert attention away from dental procedures, thereby reducing fear and improving patient outcomes. Techniques encompassed various modalities, including audio-visual aids, interactive toys, virtual reality, and behavior guidance strategies. Thus these methods represent a pivotal aspect of contemporary pediatric dentistry, offering innovative solutions to mitigate anxiety and enhance patient cooperation. Continued research and integration of novel technologies will further refine these strategies, ultimately promoting positive dental experiences and long-term oral health in children.

Copyright, IJAR, 2024,. All rights reserved.

Introduction:-

Anxiety isn't you, it's something moving through you, it can leave out the same door it came in. Nothing diminishes anxiety than action.

Dentistry exposes patients to an environment and particular experiences that trigger a natural response of fear in many people¹. Dental anxiety can be defined as a state where an individual is evoked and prepared for something to happen, with a non-specific feeling of apprehension associated with abnormal conditions.² Dental anxiety is majorly seen in children, Fear and anxiety in children might trigger behavioural management problems during dental appointments manifesting as inability or difficulty to cooperate and engage during dental treatment and delivery of oral care advice. Additionally, negative dental experiences during childhood and adolescence can also influence people's perceptions of dental care in their adult life.³ The role of a dentist in managing a child with anxiety, so that a child can become a co-operative patient is twofold - firstly, to control and treat the problem with which the child reports and secondly, to teach the child appropriate ways of managing the anxiety⁴. A range of fear management techniques have been described in the literature. They can be grouped into five general approaches: physical restraint, pharmacological methods, behavioural modelling reinforcement/contingency techniques, and distraction methods. Each method has its own advantages and disadvantages. Among these a non-aversive modality to manage a child appropriately in a dental clinic is distraction⁵. Distraction as a behavior guidance technique is defined by the American Academy of Pediatric Dentistry (AAPD) as "the technique of diverting the patient's attention from what

may be perceived as an unpleasant procedure”⁶ Distraction is identified as a much safer, effective and an inexpensive tool, where the child’s aggressive or non-cooperative behaviour can be ameliorated by diverting their attention by various methods which they are more interested in or which they find more attracted to. These techniques have significant immersive, interesting and innovational capabilities which allows dentists to efficiently manage children with behavioural problems and perform effective treatment in a stress free environment.⁷

Dental Anxiety

Dental anxiety has been ranked fifth among commonly feared situations⁸. And many factors are behind this which increases and decreases anxiety in people. Dental anxiety is a multidimensional complex phenomenon, and no one single variable can account exclusively for its development there are a number of factors that have consistently been linked with a greater incidence of dental anxiety

Factors Causing Dental Fear And Anxiety

1. Personality characteristics
2. Fear of pain
3. Blood-injury fears
4. Age and gender
5. Passed on by others
6. Dental phobia
7. Lack of dental awareness
8. Financial barriers
9. Difficult access to dental service

Signs And Symptoms Of Anxiety

There are various signs and symptoms for anxiety. Few are listed below,

1. Emotional response

- Feeling of fear
- Feeling of anxiety
- Apprehension
- Panic

2. Physiological response

- Increased heart rate
- Breathlessness
- Sweating
- Nausea
- Shaking
- Low blood pressure
- Fainting /syncope

3. Behavioural response

- Visible distress / crying
- Agitation
- High vigilance
- Withdrawal
- Using humour or aggression to mask anxiety

Anxiety Management Techniques

A range of fear management techniques have been described in the literature. They can be grouped into five general approaches:

1. Physical restraint
2. Pharmacological methods
3. Behavioural modelling
4. Reinforcement/contingency techniques
5. Distraction methods⁵

Clinical and research reports provide varying degrees of support for the effectiveness of each method. However, some methods also involve significant disadvantages. Physical restraint and pharmacological intervention may

involve a potential physical hazard to the child. Reinforcement and modelling techniques can be quite time consuming and impractical for the private practitioner to implement. In contrast, distraction methods can be safe, efficient, and inexpensive for the clinician to use. If it can be demonstrated that distraction procedures effectively reduce young children's anxiety, these procedures could be readily adopted by private practitioners⁵. There are many anxiety management techniques which we can use in the dental office but to manage the child in a more easier and efficient manner is one of the most used method called **DISTRACTION**

Distraction

Previous literature supports the management of anxiety by using distraction in their studies since 1970 . Since ages yoga and meditation has been used for treating many mental illness ,this was done by diverting the mind of the person and dentistry is also not far behind ,in dental operatory also these techniques are used to control the fearful and anxious mind of the patient . For this various methods have been used worldwide. For over a decade, distraction has been investigated and successfully applied in clinical practice to reduce pain associated with medical procedures.^{9,10,11} Successful traditional distraction techniques include, for example, watching movies¹², listening to music¹³, counting objects in the room¹⁴, and nonmedical conversation¹⁵. The application of distraction is based on the assumption that pain perception has a large psychological component in that the amount of attention directed to the noxious stimuli modulates the perceived pain.

Objectives of distraction

- Decrease the perception of unpleasantness,
- Avert negative or avoidance behavior.¹⁶

Principle of distraction

Distraction or redirection is believed to work by diverting attention to modulate pain perception. Gate control theory by Melzack and Wall¹⁷ clearly explains the principle behind distraction through the stimulation of the larger diameter type A and type B nerve fibers in a specified area using appropriate pressure or vibration, decreasing the perception of pain by closing a neural gate to nociceptive signals¹⁸. Cognitive affective attention theory is the one which explains the psychological aspects of distraction .

Types of distraction

1. Active distraction
2. Passive distraction
3. Contingent distraction

Classification Of Various Distraction Techniques Used In Paediatric Dentistry For Anxiety Management

Audio distraction

- Cassette player with headphones
- Cd player
- Prayer music
- Instrumental music
- Stories
- Rhymes
- White noise

Audio visual distraction

- Films
- Audiovisual eye glasses
- Videogames in play station
- Videogames in I pad
- Cartoons
- Virtual reality distraction
- Virtual private theatre system

Distraction using other sources

- Aromatherapy
- Thaumaturgy

- Magic tricks
- Thumb sleeves – Thumb and light method
- Magic book

Hypnotic methods

- Magnetic finger technique

Energy methods

- Emotional freedom technique

Miscellaneous methods

- Guided imagery
- Camouflage syringe
- Glove puppets
- Sleeping statues
- Distraction using games
- The 'mystery prize box
- Competition time
- Rest Breaks
- Balloon breathes





Fig 1:- Various distraction methods used in our department.

1. Audio Distraction

Audio distraction is a non-aversive technique in which patients listen to music or stories during a stressful procedure. Music's potential within healthcare settings and its broader application as a health and wellbeing intervention in the community has received much attention from researchers and practitioners in recent years. Although this is partly due to an increasing recognition that the creation, consumption and clinical application of the arts can bring considerable benefit (AHRC 2018)¹⁹, music has received special attention in this respect

Principle

The commonly accepted theory explaining the pain-, anxiety-, and stress-reducing effects of music is that music acts as a distracter, focusing the patient's attention away from negative stimuli to something pleasant and encouraging. Music occupies the patient's mind with something familiar and soothing, which allows the patient to escape into his or her "own world."

Techniques used

- Cassette player with headphones
- CD player with headphones
- Different genre of music like prayer music , rhymes and stories for kids ,
- White noise distraction

a) White Noise

The name white noise comes from the analogy to white light, which contains the whole spectrum of colours of light. White noise is similar to the sound of the rain, a rumbling waterfall, rustling leaves, a fan or a static TV. White noise can also be produced digitally or it can come in form of so called white noise machines, which are physical devices that produce white noise. White noise used as an audio distraction technique has the same amplitude or intensity, throughout the audible frequency range (20 to 20,000 Hertz). Some examples of white noise are the sound of waves, beach sounds, heartbeat noise that is used to mimic that of the mother, instrumental lullabies etc.

2. Audio Visual Distraction

Audiovisual (AV) distraction, is a passive technique composed of two sensations, visual and auditory. Audiovisual distraction is a non-pharmacological intervention technique which diverts the patient's attention from harmful or unpleasant stimuli. It is superior to traditional distraction methods, as it not only is more engaging due to the occlusive headsets that can play high quality nursery rhymes, cartoon, music, games, movies right in front of the user's eyes, but also has the capability to block out real-world stimuli.²⁰

Techniques used

- presentation through headphones or audiovisual story presentation on television
- And presentation of videotaped material or a video game.
- audiovisual video eyeglasses

- Virtual reality

a) Audio Visual Eyeglasses

Another type of AV distraction gaining popularity is the **AV eyeglasses**. AV eyeglasses are a device composed of a head-mounted display and in-ear headphones which provide close proximity device aimed at reducing visual and auditory interferences from the environment.

b) Virtual Reality Distraction

In recent years, there has been an increase in behavioural research in virtual reality (VR) and virtual world. VR refers to a human-computer interface that enables the user to interact dynamically with the computer-generated environment²¹. The working principle of VRD is that it does not interrupt the pain signals but acts both directly and indirectly on pain perception and signalling.

c) The Virtual Private Theatre System

The virtual private theatre system (VPTS) is viewed with video glasses that integrate video storage, playing and display in one digital broadcast. It features a 72-inch screen, along with it a clear screen and ear phones are provided for surround sound.

3. Aromatherapy

Aromatherapy, being an inexpensive and non-invasive relaxant is currently used worldwide in the management of various anxiety and stress-related disorders, chronic pain, and depression. It is a type of complementary medicine in which the volatile oil of plants is used to promote the level of physical, spiritual, psychological, and physiological health.

Principle

Aromatherapy using essential oil acts through the inhalation of scented oils which results in localization of the volatile molecules from oil in the lungs leading to the rapid diffusion of these molecules into the blood which causes brain activation via systemic circulation.

Techniques used

- Humidifier
- Olfactory
- Soaking gauze
- Nebulizer
- Inhaler
- Electric aroma diffuser
- Sensory
- Massage
- Topical application
- Compress
- Baths

Oils used for aromatherapy

- Lavender essential oil
- Oil of orange (Citrus aurantium)
- Sweet floral
- Eucalyptus oil,
- Apple oil
- Bergamot oil

4. Thaumaturgy

Thaumaturgy is a fancy way to say magic, It is called so because it is said that it works as a technique of work of miracles. It is originated from thumb plus turgid technique where people used to show magic trick using hand and their thumb in the early 18th century. Now recently Thaumaturgy has been used to manage anxiety in children in the form of a distraction method

Principle

- Brain is composed of two hemispheres, the left and the right, and specific functions have been attributed to each. The left hemisphere in right-handed people is characterized with verbal and voluntary skills. Language, speech analysis, and problem- solving are mediated on this side. The right side can be associated with non-verbal skills and emotions. Skills, such as art and music, are right hemisphere activities. Imagination is also thought to be associated with right hemisphere²².

Techniques used

- Magic tricks
- Magic book
- Thumb and light trick
- Animal figurines have been used as the thaumaturgical aids

5. Smart Phone Applications And Mobile Dental Apps

In today's world, most households have different electronic devices such as smartphones, tablets, and televisions through which children get introduced to various aspects of life which include medical treatment cartoons, more specifically dental treatments. The use of such electronic devices by children is also has elevated . Cartoon songs have been a source of great enjoyment for almost all children, using the dental song to reduce dental anxiety of the patients responded positively as the anxiety levels decreased .Currently, different applications have been developed or are being currently developed for use in medical and dental fields to educate the patients regarding the procedures in the hope of decreasing anxiety of the patients²³

a) Mobile Dental Apps

Another interesting invention in smart phone was the mobile dental apps for the patients and dentist , which encounters with variety of procedures like dental check-up , doctor appointment etc . Children mostly have the fear of unknown rather than known , so it would be very much helpful if we introduce them to the world of dentistry prior to their treatment procedure.

Apps used

- Little lovely dentist
- Tooth savers
- Chomper chums
- Brush up – tooth brush
- Brush DJ
- And some apps are created just to relieve dental anxiety they are acupressure , calm , colorful ,dare and headspace.

6. Hypnosis

Hypnosis has been one of the old and non-invasive ways to manage childhood dental anxiety, fear, phobia, and frustration²⁴. Hypnosis is a non-pharmacological technique still underutilized but effective in dentistry²⁵. Franz Mesmer is the founder of modern hypnotherapy²⁶. Hypnosis is defined as an induced altered state of consciousness characterized by heightened suggestibility and responsivity to the direction (Oberoi et al. 2016)²⁷. The hypnosis is a practice that is summarized in methods and techniques that improve the therapeutic results in the Dentistry specialties, not needing additional resources as medications or instruments. It can be used in a clinical environment. Through his voice, the dentist expands the patient's conscience state directing him to access the natural resources of the body and mind in favor of his well-being . Several terms can be attributed to the professional that uses this technique in dentistry, such as: hypnotist, hypnotist dental therapist, clinical hypnotist, hipnodontist and hipniatra .In the pediatric dental arena Through hypnosis it becomes possible to capture the child's attention, reduce their distress and transform their experiences of pain. These aspects can be achieved through dissociation, and it may be suggested that the child take his thoughts to another place. In fact, lies are not told the patient, because the suggestion is not that the pain will disappear, but that it gradually becomes another sensation, which is more acceptable, like a tingle or heat²⁸. Suggestions can be used with all children, and yet, hypnosis may turn out to be the only approach with a few as long as they can understand and respond to the suggestions given.

Principle

In hypnosis, there are several underlying principles that are used in many of the methods and applications. Collaboration: You need their help too. Forced cognition: Saying it makes them think it. Sensory thought: Thinking about events triggers senses. Physical thought: Thinking changes the body. Feedback: Check that it is working and works. Utilization: Make use of what happens. Everything's a resource. Confidence: The attitude of the hypnotist is key. The therapist induces a deep hypnosis, where the conscious mind steps aside, giving control to the subconscious mind, which has tremendous powers.

Techniques used

a) Hypnotic Method

- Focus on one point ,hold breath for 5 sec followed by exhaling (5 -10 times)
- Close eyes and begin reverse count from 50 , at random intervals clinician snapped his/her fingers and ask patient to go one number up from the current count.
- On reaching 0 , clinician lightly touches middle of the patients forehead and uses the words deep sleep
- Child was told how different body parts are relaxing to imagine himself/ herself in a happy and relaxed place eg ; birthday party , festival , playground , sea side.
- Count to 5 and the patient was asked to open eyes slowly

b) Magnetic Finger Technique

- Here in the method we have to make the child take two breaths
- Close your eyes
- Keep your hands straight in front of you and imagine that the forefingers are turning toward each other, as though there is a magnet between them
- With the number of 1–5, both hands will be so tight that even though you want to do so, you would not be able to separate the hands.
- You will be able to separate your hands by counting 5–1 and lay them on the side of the chair and experience a good sense of calmness and relaxation.
- Now you can open your eyes
- The eye rolling technique and the pulse rate are tested to further validate the patient's hypnotization²².



Fig. 2:- Magnetic finger induction method.

7. Emotional Freedom Technique

EFT was introduced in 1990 by Gary Craig. It states that there is a close association between emotions and energy. Any emotional disturbance is accompanied by a corresponding distortion of energy lines, these major meridian lines are stimulated by tapping on them. It is considered as an alternative treatment for physical pain and emotional distress. These tapping techniques send calming signals to the amygdala. EFT uses stimulation of acupressure points on the face, upper torso, and hands, via self-tapping. This is done while holding in mind a troubling memory or emotion in an accepting, mindful way (Church, 2013b)²⁹. EFT works experientially with key past events or with present-day symptoms, which, in the course of the work, are often traced back to earlier experiences (Church, 2013b; Church & Feinstein, 2013)²⁹

Principle

Callahan's basic TFT technique relies on knowledge of the body's meridians, the flow of energy along them and where the each meridian ends on the body. A patient thinks about a disturbing event while tapping on various acupoints on the body in a particular order. Different tapping sequences called algorithms are used for each particular condition as well as a strange routine called the gamut series which is derived from neurolinguistic programming (NLP). In simple words our body has an energy system which is effected by any distortion in our emotions , Energy and emotions are very much connected through this system , The flow of energy should not be hindered .If the flow is distorted the humans well-being also gets affected . When anxiety and fear happens in a patient the energy flow becomes blocked , so this block has to me removed , to remove this block applying pressure to certain locations helps. It relieves the blockage . So acupressure have been used . Tapping in certain sites gives pressure in those areas and it has a positive effect on relieving the blockage. This is the principle of EFT.

Technique used

Craig's method is to help a client to identify a pain or emotionally painful event

Ask what their level of distress is from 0 (no distress) to 10 (unbearable). This is known as the SUD (subjective unit of distress) level and the aim of tapping is to reduce it as far as possible, ideally to 0.

- Craig maintains that "the cause of all negative emotions is a disruption in the body's energy system" (Feinstein et al., 2005, p. 19)³⁰.The tapping process is in the sequence of
- Begin by stating what is on your mind and rating your distress on a scale of 0 to 10
- Speak your "set-up statement," which identifies the issue and includes a statement of self-acceptance
- Begin the tapping sequence, using your fingers to tap on the specified sites
- As you tap, use a reminder phrase to stay focused on your problem area
- At the end of the sequence, rate your distress
- Continue the process until your distress rating is very low.
- The acupressure points used are the heel of the hand, three locations around the eye, the area below the nose, the area below the lips, the collarbone, the underarm, and the top of the head. From seven to nine taps are delivered on each spot.

Tapping spots

- Top of head
- Eyebrow
- Corner of the eye
- Under the eye
- Below the nose
- Under the mouth
- Collar bone
- Under arm
- Karate chop



Fig. 3:- Emotional freedom technique being performed.

8. Guided Imagery Or Visual Imagery

The visual imagery technique has been defined as a directed, deliberate daydream that uses all the senses to create a focused state of relaxation and a sense of physical and emotional well-being. Further, it is believed to work with children very well because they have good ability to imagine and fantasize.³¹ There are generally three stages to guided imagery: relaxation, visualization, and positive suggestion.³² The patient, seated in the dental chair [relaxation], is asked to use their imagination skills to focus on pleasant places (e.g. beach or mountain scenery) [visualization]. This consciously encourages their psyche to reach a state of relaxation and well-being. The emotional well-being guides the body to a complete physical relaxation.

9. Camouflage Syringe

Children could link colours and emotions as pleasing or unpleasant effect.³³ Colours such as red, blue, yellow, green, black and white were associated with anger, happiness, sadness, surprise, disgust and fear respectively. One way of motivating children is by using their favourite colour. A novel, simple and child friendly modification of conventional syringe conceals the needle from child's sight, whereas still keeping the syringe functional to deliver the intended drug.

10. Glove Puppets

Blow up a glove with the three-in-one syringe (thus introducing the three-in-one syringe too). Then encourage the child to help you draw a face on it including a big smile to draw on some teeth. Get the child to help you count the number of teeth on the glove puppet and then to count their own teeth. This technique gives a feeling of newness to the child and creates a distraction in the child's mind thereby reducing his / her anxiety⁷.

11. Sleeping Statues

It is a competitive game which helps in distracting the child's mind. The introduction of a competition with the 'last little boy/girl' can help to encourage good behavior, e.g. 'Margaret, can you lie very still, like a "sleeping statue", and see how long you can stay still for? The last little boy/girl managed to stay still until we counted to 100 and he/she was very clever like you. Do you think you can beat him/her? I bet you can!'⁷

12. The 'mystery prize box'

Sometimes, reward from the 'mystery prize box' can entice the child enough to allow that final piece of more difficult treatment, e.g. extraction, to be completed. The prize box sits high on the shelf so it is visible, but the child doesn't know what is inside it until the end of the appointment. It contains various inexpensive items such as toothbrushes, colour boxes or current movie trend characters on pencils, rubbers, note pads, hair clips, rulers, etc.⁷.

13. Competition Time

It is a Competitive game between patient and dentist. When placing separators prior to Hall technique of stainless steel crown placement, the concept of a competition between a patient and dentist appears to work well e.g. when placing the separators (using floss, authors preference), the dentist tries really hard to 'make your head wriggle from side to side but you have to try and stay very still. If you can stay still then you win the sticker, if your head wriggles then I win the sticker'; inevitably and thankfully, it is almost always 1:0 to the patient. When they return for their Hall crown, this time to 'beat the dentist', they have to have the crown put on then bite really hard on the cotton wool roll, while the dentist tries to wriggle out the cotton wool roll from between their teeth, again, generally 1:0 to the patient.

14. Rest Breaks

AAPD recognizes that giving the child patient a short break during a stressful procedure can be an effective use of distraction prior to considering more advanced behavior guidance techniques.³⁴

15. Balloon Breathes / Belly Breaths

Balloon breaths is a fun themed deep breathing aka belly breathing exercise. The idea of the exercise is for children to use their imaginations to help them visualise a balloon in their bellies. When they are able to imagine the balloon in their belly, then it is easier for them to focus their attention on directing the air they inhale deeper and breathing in fuller. Imagining that you are inflating a brightly coloured balloon also makes the breathing exercise playful and fun⁷.

Technique used

The patient prior to their treatment sitting in the dental chair is been asked to “Imagine that he/ she is holding a brightly coloured balloon between their hands, as it fills with air the hands expand and as the air deflates from the balloon the hands get closer, that’s how the bellies will feel.” (You can model expanding and decreasing the imaginary balloon between your hands or use a Hoberman sphere if you have one available.)the dentist have to explain this to the child .the dentist starts by saying “Now let me show you first, I relax my shoulders and sit up tall, put my hand on my belly and take a big breath in, I can feel my belly getting bigger and slowly as I breathe out the balloon is deflates.” The following have to be done sequential ,

- Wiggle your shoulders and Sit up tall. pop your hand on your belly.
- Imagine that your belly is a balloon. Take in a slow, deep breath and imagine filling up the balloon.
- Then exhale slowly, deflating the balloon in your belly
- Let’s try that again, but this time if you feel comfortable you can close your eyes. Really focus on filling your belly with air and noticing the belly getting bigger.
- As you exhale, imagine the balloon slowly floating away high up into the sky.



Fig 4:- Post distraction happy faces.

Conclusion:-

Behavior management is as fundamental to the successful treatment of children as are skills and knowledge of dental materials³⁵. Uncooperative behavior can interfere significantly with providing quality dental care, resulting in increased delivery time, risk of injury to the child and eventually unsatisfied parents. In fact, surveys of clinicians have found that the dentists consider the uncooperative child to be among the most troublesome problems in clinical practice³⁶ Thus, Professional recognition of these difficulties significantly heightened the interest in behavior management and led to the development of a well-established child behavior management armamentarium for dentists. Further, it also led down the path where dental practitioners began to confer the subject of behavior management, the same respect and objectivity that they have accorded with other areas of science in dentistry³⁷. Thus, paving the way to the invention of newer non-invasive behavior management techniques for children, among which distraction techniques like, magic tricks, audiovisual distraction, mobile dental apps, video game distraction, virtual-reality based distraction has gained immense popularity. These contemporary distraction techniques have significant immersive, interesting and innovative capabilities which allows dentists to efficiently manage children with behavioural problems and perform effective treatment in a stress-free environment³⁸. A stress free dental environment is the No 1 need of a pediatric specialist to do his work with ease and confidence ,for that these techniques will be very much helpful.

References:-

1. AI LR, Quesada JR B. Effect of audiovisual distraction on children's behaviour, anxiety and pain in the dental setting. *European Journal of Paediatric Dentistry*. 2014 Sep 1;15(3):297-302.
2. Alkahtani ZM, Zakirulla M, Alshehri ES, Alqahtani AM, Alshehri MM. The Effect of Music on Children's Anxiety During Dental Treatment. *Journal of Research in Medical and Dental Science*. 2020 May;8(3):39-43.
3. Robertson M, Araujo M, Innes N. Anxiety and fear management in paediatric dentistry using distraction techniques. *Evidence-Based Dentistry*. 2019 Jun;20(2):50-1.

4. Prabhakar AR, Marwah N, Raju OS. A comparison between audio and audiovisual distraction techniques in managing anxious pediatric dental patients. *Journal of Indian Society of Pedodontics and Preventive Dentistry*. 2007 Oct 1;25(4):177.
5. Venham LL, Goldstein M, Gaulin-Kremer E, Peteros K, Cohan J, Fairbanks J. Effectiveness of a distraction technique in managing young dental patients. *Pediatr Dent*. 1981 Mar;3(1):7-11.
6. Felemban OM, Alshamrani RM, Aljeddawi DH, Bagher SM. Effect of virtual reality distraction on pain and anxiety during infiltration anesthesia in pediatric patients: a randomized clinical trial. *BMC Oral Health*. 2021 Dec;21(1):1-0.
7. Fatma N. Contemporary Distraction Tools Used In Pediatric Dentistry: An Overview. *university journal of dental sciences*. 2021 Aug 5;7(3).
8. Mohammed RB, Lalithamma T, Varma DM, Sudhakar KN, Srinivas B, Krishnamraju PV, Shaik AB. Prevalence of dental anxiety and its relation to age and gender in coastal Andhra (Visakhapatnam) population, India. *J Nat Sci Biol Med*. 2014 Jul;5(2):409-14. doi: 10.4103/0976-9668.136210. PMID: 25097425; PMCID: PMC4121925.
9. Kleiber C, Harper D: Effects of distraction on children's pain and distress during medical procedures: A meta-analysis. *Nursing Research*. 1999, 48:44-49.
10. McCaul K, Malott J: Distraction and coping with pain. *Psychological Bulletin*. 1984, 95:516-533.
11. Miller AC, Hickman LC, Lemasters GK: A distraction technique for control of burn pain. *Journal of Burn Care & Rehabilitation*. 1992, 13:576-580.
12. Cohen L, Blount R, Cohen R, Schaen E, Zaff J: Comparative study of distraction versus topical anesthesia for pediatric pain management during immunizations. *Health Psychology*. 1999, 18:591-598.
13. Fowler-Kerry S, Lander J: Management of injection pain in children. *Pain*. 1987, 30:69-75.
14. Zeltzer LK, Dolgin M, LeBaron S, LeBaron C: A randomized, controlled study of behavioral intervention for chemotherapy distress in children with cancer. *Pediatrics*. 1991, 88:34-42.
15. Blount RL, Powers SW, Cotter MW, Swan S, Free K: Making the system work. Training pediatric oncology patients to cope and their parents to coach them during BMA/LP procedures. *Behavior Modification*. 1994, 18:6-31.
16. American Academy of Pediatric Dentistry, Council on Clinical Affairs—Committee on Behavior Guidance. 2015. Guideline on Behavior Guidance for the Pediatric Dental Patient.
17. Melzack R, Wall PD. Pain mechanisms: a new theory. *Science*. 1965;150:971-979.
18. Nunna M, Dasaraju RK, Kamatham R, Mallineni SK, Nuvvula S. Comparative evaluation of virtual reality distraction and counter-stimulation on dental anxiety and pain perception in children. *Journal of dental anesthesia and pain medicine*. 2019 Oct;19(5):277.
19. Arts and Humanities Research Council. <https://ahrc.ukri.org/news/vents/news/all-party-parliamentary-inquiry-into-arts-health-and-wellbeing-launches-report/>. Accessed 18 May 2018.
20. Al-Khotani A, Bello LA, Christidis N. Effects of audiovisual distraction on children's behaviour during dental treatment: a randomized controlled clinical trial. *Acta Odontol Scand*. 2016;74:494-501.
21. Rao DG, Havale R, Nagaraj M, Karobari NM, Latha AM, Tharay N, Shrutha SP. Assessment of efficacy of virtual reality distraction in reducing pain perception and anxiety in children aged 6-10 years: A behavioral interventional study. *International journal of clinical pediatric dentistry*. 2019 Nov;12(6):510.
22. Waxman D. *Hartland's Medical and Dental Hypnosis*. 3rd ed., London: Bailliere Tindall; 1989.
23. Abbasi H, Saqib M, Jouhar R, Lal A, Ahmed N, Ahmed MA, Alam MK. The efficacy of little lovely dentist, dental song, and tell-show-do techniques in alleviating dental anxiety in paediatric patients: a clinical trial. *BioMed research international*. 2021 May 23;2021.
24. Accardi MC, Milling LS. The effectiveness of hypnosis for reducing procedure-related pain in children and adolescents: A comprehensive methodological review. *J Behav Med* 2009;32:328-39.
25. Patel B, Potter C, Mellor AC. The use of hypnosis in dentistry: A review. *Dent Update* 2000;27:198-202.
26. Roberts K. Hypnosis in dentistry. *Dent Update* 2006;33:312-4.
27. Santos SA, Gleiser R, Ardenghi TM. T Hypnosis in the control of pain and anxiety in Pediatric Dentistry: a literature review. *RGO, Rev Gaúch Odontol*. 2019;67:e20190033. <http://dx.doi.org/10.1590/1981-86372019000333602>
28. Al-Harasi S, Ashley PF, Moles DR, Parekh S, Walters V. Hypnosis for children undergoing dental treatment. *Cochrane Database Syst Rev*. 2010 Aug 4;(8):CD007154. <http://dx.doi.org/10.1002/14651858.CD007154.pub2>
29. Church D. Clinical EFT as an evidence-based practice for the treatment of psychological and physiological conditions. *Psychology*. 2013 Jul 24;4(08):645.

30. Feinstein D. Acupoint stimulation in treating psychological disorders: Evidence of efficacy. Review of General Psychology. 2012 Dec;16(4):364-80.
31. Appukuttan DP. Strategies to manage patients with dental anxiety and dental phobia: literature review. Clinical, Cosmetic and Investigational Dentistry 2016;8:35-50.
32. Anthonappa RP, Ashley PF, Bonetti DL, Lombardo G, Riley P . Non-pharmacological interventions for managing dental anxiety in children. Cochrane Database Syst Rev 2017, issue-6.
33. Umamaheshwari N , Asokan S ,Kumaran TS .Child -friendly colors in a pediatric dental practise .J Indian Soc Pedod Prev Dent 2013;31 :225 -8
34. Kamal S,Vaibhav A. Patient dentist communication ;An adjunct to successful complete denture treatment . J Prosthodont 2010;19:491-3
35. Pinkham JR. Behavioral themes in dentistry for children. ASDC J Dent Child 1990;57:38-45.
36. Ingersoll TG, Ingersoll BD, Seime RJ, McCutcheon WR. A survey of patient and auxiliary problems as they relate to behavioral dentistry curricula. J Dent Educ 1978;42:260-3.
37. Teuscher, C. W. (1973). Editorial. J Dent Child 1973;40:259.
38. Swarna K, Prathima GS, Suganya M, Sanguida A, Selvabalaji A: Recent Advances in Non- Pharmacological Behaviour Management Techniques in Children – An Overview. IOSR-JDMS 2019;18:18-21.