

Behavior Puzzle: Nonpharmacological Behavior Management

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ABSTRACT

A child's dental visit may often be associated with dental fear and anxiety (DFA). Children with DFA may exhibit dental behavior management problems (DBMPs), which mostly manifest as disruptive behavior. Children displaying disruptive behavior are often more challenging to treat, require more chairside time, and can result in a stressful appointment for the child, parent, and even the dentist. Factors that are specific triggers for DFA need to be identified, and their behavior assessed. This would help the dentist modify the child's behavior using appropriate behavior management techniques (BMTs) to facilitate the delivery of quality dental care. This article is not meant to be dogmatic or serve as a rulebook or a legal document. It sheds light on some practical methods of assessment of child behavior and communication, the key concepts in behavior guidance. The authors have also attempted to compile the nonpharmacological BMTs used in current clinical practice with evidence from the Indian scenario. They have also shared some of their personal experiences gained in the process of guiding children's behavior in the dental setting over the past two to three decades.

Keywords: Behavior guidance, Behavior management, Nonpharmacological behavior management techniques.

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INTRODUCTION

Dental visits for children are often fraught with fear and anxiety. While most assume that the reason for dental fear and anxiety (DFA) is a previous distressing dental appointment, a more significant determinant may be the way the child perceives the same.¹⁻³ Children with DFA can have excessive pain expectancies and perception⁴⁻⁶ that often manifest as less-than-desirable behavior, which can range from mild resistance to defiant and disruptive behavior. This may be magnified in very young children who may lack the cognitive abilities to process the dental visit. The less-than-optimum, undesirable behaviors are collectively referred to as dental behavior management problems (DBMPs). These DBMPs may often be the only impediment to the high-quality dental care delivery to the child.

Children displaying disruptive behavior are often more challenging to treat, require more chairside time, and can cause stress to the dentist.⁷ This can lead to an unpleasant experience for both the patient and the treating dentist.⁸ An unpleasant dental experience can result in dental avoidance, further compounding the already existing poor oral health.^{9,10} The resultant untreated and therefore advanced dental disease, in turn, will require more complex, time-consuming, expensive, and sometimes complicated treatment procedures. Fear and anxiety, including DFA, if not appropriately managed, can result in the establishment of a vicious cycle of dental fear.^{11,12} In most occasions in the Indian scenario, this is further worsened by the fact that children are brought to the dentist in an advanced stage of dental disease. Their dental visit mostly happens after all the available home-based and local remedies have been tried and exhausted without any desired tangible benefits. This delay leads to more significant anxiety and pain associated with the anticipated treatment, resulting in the child displaying more DBMP. Klingberg and Broberg reported the prevalence of DBMP in the range of 6–29% in children of low- and middle-income countries.¹³ Children with DFA may exhibit DBMP. But all children who exhibit DBMP need not necessarily have DFA. There could be factors other than DFA that can negatively influence the behavior of the child (Table 1). Hence, it is challenging for the pediatric dentist to identify

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Table 1: Factors influencing children's behavior in the dental setting

Factors under the control of the dentist
• Pediatric dental setup
• Dentist's attire
• Dental team and its attitude
• Communication skills
• Coordination among the team members
• Quality of dental care rendered (pain experienced during dental treatment)
• Odors in the waiting area or operatory (eugenol/phenyl)
• Provisions to engage the child in the waiting area
• Soundproofing in operatory
• Presence/absence of parent/s in the operatory
• Positive praise for good behavior
Factors under the control of the parent
• Positive attitude toward oral health
• Environment at home/economic hardships
• Maternal anxiety
• Parenting styles/parent-child interactions
• Parental attitude toward BMTs
• Discussion of past unpleasant visit in front of the child
• Lying to the child about what will be done and not done at the dental clinic
Other factors that influence behavior
• Age of child
• Temperament
• Ordinal position among siblings
• Stage of intellectual and cognitive development
• Cultural factors
• Socioeconomic factors
• Underlying general health condition
• Upper respiratory tract infection (nasal congestion)
• Subclinical febrile condition
• Ulcers in the mouth
• Fear of medical/dental personnel and/or hospital settings
• Anticipation of some intervention and associated pain
• Sleepy (nap time and dental appointment time coincides)
• Appointment scheduled at play time
• Lied by parent/s and brought to the dentist
• Bad day at school (because of teacher/bully)
• Personal loss (close family member/pet)
• Hungry/thirsty
• "Anything under the sun" can influence the behavior of the child!

and differentiate the cause of the DBMPs, making the right choice for the best combination of behavior management techniques (BMTs) that will allow the delivery of dental care.

The pediatric dentist must also attempt to assess and understand whether the patient is generally anxious (trait anxiety) or if the anxiety is explicitly associated with the dental visit (state anxiety). Factors that are specific triggers for dental and other fear/anxiety need to be identified.¹⁴ Once the triggers are identified and behavior is assessed, it may be beneficial to all the concerned (child/parent/dentist). The disruptive behavior is shaped, modified, or guided to facilitate the delivery of quality dental care (meeting the short-term needs) while endeavoring to create within the mind of the child and parent a positive attitude toward dentistry (long-term need). A child with a past pleasant dental experience would possibly, in the future, be a proactive seeker of regular preventive dental care, resulting in fewer dental problems and an overall improvement in their oral health.

Behavior Assessment

There are multitudinous factors that can influence a child's behavior, which include developmental age,^{15–17} parenting styles, general health, pathology, previous dental experiences, culture, social expectations, and temperament.¹⁸

The dentist needs to assess the behavior of the child during the first visit to the dental office. This will help identify the level of DFA, the likely cause for the disruptive behavior, predict apparent behavior during future appointments, and categorize the type of behavior observed, all of which will, in turn, help choose the best possible combination of behavior guidance techniques (BGTs).

There is no single foolproof method for a behavior assessment. It may be carried out by gathering information: (1) initially from parents and (2) by direct observation and interaction with the child/parents/guardians/caregivers.

Initial Information from Parents (Diagnostic Interview)

(A) History from mother to child

Child's cognitive level. Temperament/personality characteristics.

Level of anxiety/fear.

Reaction to strangers.

Reaction/response to discomfort/pain.

Behavior at previous medical/dental visits.

The anticipation of the parent on how the child will react to dental treatment in the future.

(B) Parents assessment of dental fear and anxiety

A child's behavior has been primarily predicted by the parents across the globe using the Children's Fear Survey Scale-Dental Subscale (CFSS-DS) and Corah's Dental Anxiety Scale (CDAS).

Direct Observation and Interaction with the Child

(A) Observing the child

Asokan et al. used a ten-point scale to observe the overt and subtle behavioral characteristics of a child in the waiting room to predict the behavior during dental treatment, for example¹⁹:

Walks in boldly/independently—approachable.

Hides behind mother/peep out—somewhat shy.

S/he was carried in by mother/looking away—definitely shy.

Dragged in against the will—withdrawn.

(B) Interacting with the child (self-assessment)

Self-report would always remain the method of choice for assessing DFA or pain. Children <8 years of age, due to limited cognitive abilities, find it difficult to report their feelings or opinions accurately.²⁰ Small icons of dentistry-related situations or happy-to-sad faces^{21–23} have been used successfully to help children. In general, visual analog scales (VAS) have been used effectively with young children, with "very cooperative" and "uncooperative" as the clinical endpoints.

While both methods essentially focus on the behavior of the child in the dental setting, they provide an opportunity to observe the behavior and reaction of the parents/caregiver in the dental environment. This, in turn, will help give an insight into the advice that is given to the parent (e.g., be a silent observer during treatment) and the type of BMTs that may be acceptable to the parents/caregivers.

Frankl behavior rating scale remains the gold standard tool to categorize/classify the behavior of the child in the dental office. This scale gives a clear idea of whether the child would be positive/cooperative or negative/uncooperative, an endpoint obtained similar to the VAS. Wright's classification of cooperative behavior

would go one step further to categorize the potentially cooperative behaviors of children, providing the dentist with a better picture of what to expect from the child during the dental visits. These basic assessments and categorizations help the dentist choose the appropriate techniques for behavior management, behavior modification, behavior shaping, or behavior guidance.

The foundation/cornerstone for all effective nonpharmacological behavior guidance as well as pharmacological BGTs is communication. It remains the number one priority BGTs.²⁴

Communication

The successful practice of pediatric dentistry depends on the establishment of good communication between the dentist, the child, and the caregiver. It is a three-way dynamic interaction, as demonstrated through the pediatric dentistry treatment triangle. The fundamental requirements for communication in the dental setting are: to be effective, it must;

- Involve both the child and parent.
- Be multisensory.
- Be listening focused.
- Be empathetic.

Involve both the Child and Parent

Communication with children involves understanding the child's level of development and comprehension, and the use of language (including sign language) appropriate for that level of understanding. The liberal use of euphemisms, when indicated, helps. Communication is enhanced by getting to know the child, developing a rapport, creating a heart-level connection, and establishing trust. Parental influence on children's behavior has been well documented. The ability of the child to cope with the stimuli and stress in the dental setting is influenced by structured parental upbringing.²⁵ Consistent nurturing of the child at home (limits, rewards, and punishment)^{21,26,27} increases the likelihood of successful behavior management.²⁸ Parent-child interactions could predict potential challenging behaviors in the dental setting and the possible outcome of parental inclusion or exclusion from the treatment session.^{29,30} Indian children of permissive and authoritarian parents showed more negative dental behavior than children of authoritative parents.³¹ Besides parent-child interactions, there are also reports of the correlation between the maternal trait and state anxiety and the behavior of children in the dental setting.¹⁴ Due to the change in parenting styles, there is an increasing desire for parents to get actively involved in all activities of their children's lives. For younger children, parents make choices.

The choice of BMTs may also depend on parents' opinions about the technique and their acceptability to implement the same on their children.^{32,33} Therefore, it would be prudent to involve the parents to a greater extent, though most conversations in the pediatric dental setup revolve around children. Communication between the dentist and the parents or primary caregivers of the child is equally essential for a successful pediatric dental practice. Getting the parents involved allows them a greater sense of responsibility and better compliance during informed decision-making.

Occasionally, socioeconomic status, educational status, dental attitudes based on different cultural backgrounds, and the linguistic skills of the parent may present challenges to open and clear communication.^{34,35} This can be overcome with patience and persistence, often by making an effort to repeat instructions

wherever necessary and positively reinforcing the smallest steps in the direction of improved oral health status.

The pediatric dentist must make every effort to communicate effectively and efficiently with the parents. They must help the parents understand and accept pediatric oral health care concepts and treatments. Besides the general free-flowing, transparent, and engaging interaction with the parents, there is the pre-appointment preparation and the specific communication techniques that may be used in the dental setting. This includes the "Ask-Tell-Ask," "Teach-Back," and "Motivational Interviewing" techniques that reflect the dentist's parent-centered approach.³⁶ In the "Ask-Tell-Ask" technique, the child's feelings related to the planned procedure are asked; the procedures are explained (told) through demonstrations and nonthreatening language appropriate to the cognitive level of the child, and the child's feelings about the treatment are asked again.³⁶ The "Ask-Tell-Ask" technique can be used with the parents as well for effective communication.

The dentist can ask the child or the parent to "Teach-Back" what they have learned. This can be effective, especially for parents with low educational status who cannot read or understand the written reminders handed over to them. In motivational interviewing, behavioral change is brought out by helping children or parents resolve their ambivalence about the intended change. It uses the child's reasons for the change. Open-ended questions, affirmations, reflective listening, and summarizing (OARS) characterize this patient-centered approach.³⁶

Multisensory Communication

Multisensory communication includes both verbal and nonverbal communication. It involves words (verbal), body posture, facial expressions, gestures, volume and tone of the voice, and the speed at which it is spoken (nonverbal). According to Mehrabian, 55% of all communication is nonverbal (facial expressions, gestures, good touch). 38% is paraverbal (tone, volume, pitch, and speed of speaking), while verbal communication (words) accounts for only 7% of all communication, thereby underlining the importance of nonverbal communication. Literature reports that clinicians who make eye contact, appropriate facial expressions, and an open arm posture are regarded as open, warm, and empathetic.³⁷ It was reported that children were able to communicate better in the dental health care setting using the write-and-draw technique.³⁸

Listening Focused

In 77% of conversations between two people, one will interrupt the other every 18–23 seconds. Active listening and reflective listening are soft skills a pediatric dentist must master. When the child and parent feel "heard," it often results in a heart-level connection. This is the key to the development of trust, a fundamental aspect of any meaningful relationship. Two-way communication is complete and meaningful only when active listening happens. Listening "silently" with compassion to what the child and parent are saying while watching for nonverbal cues (body language, facial expressions, etc.) is essential to establishing rapport. Communication with children in the dental setting has been elaborately described by Asokan and Nuvvula.³⁹ They coined the terminology "Pediatric dentistese"—the way pediatric dentists communicate with children.

Empathetic

Irrespective of whether the communication is verbal or nonverbal, it must be empathetic and deeply concerned about the well-being

of the child. It involves the ability to see and experience a situation from the other person's frame of reference.^{40,41}

Clinical empathy is a fundamental determinant in the quality of healthcare⁴² and the use of empathy has been considered a key skill in building a doctor-patient relationship.^{43,44} It is a key expectation from healthcare providers, and most patients expressed the need to have a clinician who has an empathetic approach and the willingness to listen.⁴⁵ An empathetic approach has been shown to improve the doctor-patient relationship and satisfaction levels of both patients and clinicians.^{46–48} It was reported that 65% of patient satisfaction was attributed to physician empathy.⁴⁹ It also resulted in an improved attitude and behavior of the patient, resulting in better adherence and compliance.⁵⁰ There was also a reduction in medicolegal problems, which resulted in being an excellent practice builder.⁵¹ A similar desire to have an empathetic clinician was reported by Dasaraju et al. in a pediatric dental healthcare setting.³⁸

Many of the researchers believed that empathy is an inherent skill, and you are either born with it or not. The happy news is that empathy is a teachable and learnable skill.⁵² For example, when the child says, "Doctor, I'm scared," do not deny the child his freedom to express himself by saying, "What's there to be scared of? Come on, be brave!" Instead, it may be more appropriate to respond by saying, "It's all right to be scared. When I was your age, and my father took me to the dentist, I was scared too." This creates an undeniable bond as the child finds a reason to connect with the dentist.

Communication—Based on the Stage of the Dental Engagement Process

Communication before Arrival

Communication begins much before the child arrives at the dental operatory or dental chair. The genuine, warm, reassuring voice of the receptionist often sets the tone for all future interactions between the pediatric dental team, the child, and his or her family.

Preappointment Instructions

The mother, guardian, or caretaker can be provided information about the planned appointment and the preappointment preparation for the dental visit. This includes information on how they need to relax and avoid the subtle transfer of their anxiety to the child. Suggestions such as reading a book or watching a video (a funny one could help) about a fun dental appointment or playing dentist with the child may be helpful.

The parents must be gently reminded not to voice their own fears about a dental appointment, even inadvertently, or suggest what the dentist will do or not do. Parents are instructed to carry all dental and medical records (if any), to ensure the child can bring his or her comfort toy, and to remind the child to use the restroom before the appointment. These can round off the preliminary instructions.

At the Dental Setup

When the child and the family arrive at the dental setup, even before a word is spoken, the "setup"—the reception and play area—are already communicating how you care for them. This also sets a positive and happy tone for everything to follow.

This is important because individuals often associate the feelings of anxiety and anticipation of pain at the dental visit with the distinctive sights, smells, sounds, and sensations experienced in a dental setup. Reducing these stress triggers helps manage

anxious patients. Changing the appearance and odor of the dental health care setting has been reported to affect perceived anxiety. Umamaheshwari et al. showed that the use of child-friendly primary colors such as yellow and blue in the dental setting could help create a positive dental attitude in the child's mind.⁵³ Panda et al. showed that a majority of Indian children preferred music and the ability to play in a waiting room that had walls adorned with pictures.⁵⁴ They also liked looking at an aquarium or a television.

The Team

An organized team with the "We care for you" approach is an excellent way of reducing the anxiety associated with the dental visit, especially for the parents, as it is reassuring for them to see that they are entrusting the care of their child to a professional team, focused, compassionate, and interested in the welfare of their child.

Establishing Trust

All activities during the first interaction are centered around gaining the trust of the child and parent while giving them opportunities to settle in. This approach primarily entails communication (nonverbal and verbal) and may sometimes involve very little treatment and even the possible deferral of treatment (unless there is an emergency). It is imperative to ensure that when the child leaves after the first interaction, the child is happy and looks forward to the next dental appointment.

Before the Appointment Begins

Set the rules beforehand about "signaling—when to stop" and "rest breaks." This is a kind of "earned rest" or "contingent escape" and is a type of negative reinforcement that helps the child behave better. The parents and caregivers could help in the "number counting process."

During the Dental Appointment

During the dental appointment, what can initially be a dialogue can gradually be transformed into a monologue (keeping in mind that dental treatment primarily occurs in the oral cavity). If the child desires, and depending on the request made prior to the start of treatment, relevant information about the procedure in simplified terms (using euphemisms) can be provided from time to time during the appointment. It would be prudent to verbally compliment and reinforce every effort on the part of the child and parent to cope with the dental appointment, compliance with instructions, and good behavior demonstrated during the appointment. Nonverbal communication is expressed in the form of behavior, attitude, facial expressions, and communicative stance of the dentist. This systematic approach directed at calming the patient through the behavior, attitude, facial expressions, and communicative stance of the dentist is termed the "latrosedative technique." It was found to help create a bond of understanding, trust, and confidence between the child, parent, and dentist.^{55,56} This would help reinforce behavior that would be desirable at subsequent appointments.

The Parental Presence or Absence

Parental presence or absence can be used as a behavior guidance strategy depending on the ability and level of comfort of the dentist.⁵⁷ In the case of mildly anxious patients, passive parental presence during dental treatment can be used to gain cooperation from the child to perform the dental treatment. Parents prefer to be present, participate, and be involved in their children's treatment out of a latent need to be protective of them. It also provides an

opportunity for the parent(s) to physically and psychologically support their children. Parental presence does not worsen a child's behavior. Instead, it may have a positive effect on preschool children. However, if the parent starts communicating with the child during the treatment, it may make communication between the dentist and the child more difficult.^{58,59} The only possible contraindication may be parents who are unable or unwilling to extend effective support.^{32,60,61}

Parental Acceptance of Behavior Management Techniques

While some techniques used to deal with the disruptive behavior of children in the dental setting may be more acceptable to the parents, there are others that the parents disapprove of. Muhammad et al. reported that a majority (99%) of parents regarded the use of various BMTs as a critical factor for successful dental care for their children.⁶² Parents preferred the nonpharmacological techniques (NPTs) to pharmacological techniques. Methods employing drugs and restraints were considered the least acceptable. Effective communication, tell-show-do (TSD), positive reinforcement, distraction, modeling, and nonverbal communication were considered the most approved techniques. Hypnosis and parental separation were moderately approved techniques. Voice control, hand-over-mouth (HOM) technique, protective stabilization (physical restraints), conscious sedation (nitrous oxide sedation), and general anesthesia (GA) were the least approved techniques.⁶³

The BGTs have been proposed in an attempt to reduce children's dental anxiety and help the child overcome DFA and DBMP. They include a spectrum that ranges from the NPTs on one hand to GA on the other end, with mild, moderate, and deep sedation available in between. These techniques, when used in various combinations at different points in time, are based on the fundamentals of truthfulness, tolerance, positive approach, flexibility, organized team attitude, and the ability to communicate, helping children learn about and understand dental procedures. It helps them potentially accept what can occur in the dental environment in a way that minimizes their anxiety.

Very often, the principal focus of behavior management is on the "techniques" rather than the child and disruptive behavior. Instead, if the child were the focus and an attempt was made to understand the cause behind the disruptive behavior, this would enable the clinician to judiciously select potentially effective behavior guidance or management techniques and use them with maximum effect. This could result in the use of far fewer "techniques." It is essential to be flexible while choosing BGTs, that is, the dentist can begin with a particular technique or combination of techniques, and with time, may choose to change this combination of techniques. Some of the nonpharmacological BMTs include: TSD, systematic desensitization with graded exposure, implosion therapy and flooding, contingency management including reinforcements, voice control, HOM technique, protective stabilization, modeling, retraining, distraction, and memory reconstruction.⁶⁴⁻⁶⁹

Tell-show-do

Tell-show-do would be a classic example of desensitization. For example, for many children, the sound of the drill may be distressing. Children are detailed about the handpiece in simple and age-appropriate vocabulary. They are shown the drill and allowed to touch and hold it until they get comfortable with it. The dentist then demonstrates the functioning of the drill while getting the children to focus on the spray of water, which most children find

nonthreatening. They are then directed to the sound associated with the spray of water, which they found threatening earlier. This conditioning usually helps reduce the anxiety associated with the sound. Finally, the feel of the working air rotor is demonstrated against the child's fingernail using a blank instead of a bur. This allows the child to feel the vibrations and the water spray and hear the sound associated with the working air rotor without experiencing any kind of discomfort or pain.

Systematic Desensitization

Systematic desensitization is a type of behavioral therapy based on the principle of classical conditioning. It involves three stages: (1) teach the patient to relax with breathing or play therapy, (2) construct a hierarchy of fear-producing stimuli related to the person's principal fear, and (3) describe each stimulus in the hierarchy, starting with the least fear-producing and moving to the next stimulus only when the individual no longer fears the previous stimulus and is comfortable and relaxed. Due to this, the child will be ready to face the next-level stimulus psychologically.

Fearful dental patients who completed a systematic desensitization program showed a far greater decrease in levels of fear and improvement in mood following dental treatment when compared to those who received diazepam before dental treatment.⁷⁰

Graded *in vivo* exposure operates on the same principle as systematic desensitization. It involves the creation of a hierarchy of fear-producing stimuli in the dental setting, followed by the systematic forced exposure to the actual stimulus that provoked the original trauma in a hierarchy starting with the least fear-provoking stimulus and moving to the most fearful stimuli. It is different from systematic desensitization or *in vitro* exposure, where the individual is made to think about or imagine the exposure to the fearful stimulus. The individual does not face the threatening stimulus directly.⁷¹

Flooding and implosion therapy are usually discussed together. Implosion therapy operates on the same principle as TSD and systematic desensitization but is used where the origin of fear is subjective and more severe in nature (phobia). In the mid-1960s, Stampfl and Levis pioneered this technique to treat phobias. Phobic patients are bombarded with detailed descriptions of the situations that they feared for 6–9 continuous hours. At the end of this therapy, they lost their fear of those situations.⁷²

Flooding is also a more aversive form of desensitization. It involves forced, prolonged, and repeated exposure to the actual fear-inducing stimulus that provoked the original trauma until the individual no longer shows a fear response. It is usually used to treat phobias when the origin of the fear is objective. About 48% of individuals completed dental treatment after 2 months following two sessions of flooding.⁷³ There is very little published research, probably because of the aversive and high anxiety-inducing nature of the technique.

Undesirable responses learned through classical conditioning can often be unlearned through counter-conditioning. It involves breaking previous unpleasant associations (e.g., dental clinic and unpleasant fearful experience) and creating a new set of associations. This is done by gradually associating a pleasant unconditioned stimulus with the conditioned stimulus for fear. For example, setting up a child-friendly pediatric dental practice with a play area in the waiting area or a colorful dental operatory.⁷⁴

Contingency Management

Contingency management is a technique where the consistent presentation of positive or negative consequences following a particular behavior influences the likelihood of the subsequent behavior of the child being repeated or discontinued. It includes positive reinforcement, negative reinforcement, omission/time-out, and positive punishment in the form of the use of aversive techniques.⁷⁴

Positive Reinforcement

Positive reinforcement is a technique that rewards the specific desired behavior and hence increases the likelihood of the desired behaviors being repeated at subsequent appointments.^{71,75,76} Reinforcers can be of three types: social, material, and activity reinforcers. Social reinforcers comprise positive voice modulation, facial expression, and verbal praise. Descriptive praise appreciates the specific desired (cooperative) behaviors (e.g., "Thank you for sitting without moving," "You are doing great, keeping your hands in your lap") rather than generalized praise (e.g., "Good job").⁷⁷ Material reinforcers include gifts like tokens and toys. The descriptive praise should be given as a reward after the desired cooperative behavior is seen and not as a bribe before the desired behavior is demonstrated. Activity reinforcers allow children to spend time in their favorite activity, such as visiting a park or playing a game after the successful completion of the dental procedure. Positive praise and a short period of escape for about 10 seconds act as excellent rewards for children sitting still, being compliant, and generally being cooperative during the dental visit.⁶⁶ Positive reinforcement, the universally accepted behavior guidance technique,⁷⁸ after a successful dental visit, provides a useful incentive for cooperation or appropriate behavior in subsequent visits.

Negative Reinforcement

Removal of the unpleasant stimulus to increase the chance of the desired behavior is called negative reinforcement. It is also called "escape"—escape from unpleasant or undesirable events. It actually motivates and plays a significant role in dealing with a wide variety of problem behaviors, including tantrums and other disruptive behaviors.^{79–81} During a restorative procedure, the use of a syringe, sounds from the drill, and use of a rubber dam/clamp increases the DFA in a child. Natural responses of a child would be to escape or avoid the dental gadgets or procedures by fending off, turning the head away, or crying uncontrollably. Children must be made to learn "escape behavior" and not "avoidance behavior" in the dental operatory. Children must earn their rest by showing the desired behavior for a count of 10 or 20. They can be asked to signal by raising their hand when they find it difficult to cope with the dental procedure or when the count number has been reached. This "earned rest" is also called the contingent escape method. Contingent escape is based on operant conditioning and is designed to not only diminish undesirable behaviors but also to increase desirable behaviors. Contingent escape provides immediate feedback to teach children more adaptive coping behaviors.^{65,66} If the child does not allow for the dental treatment and is sent home considering his undesired behavior, there is a high chance that the child would behave exactly the same way in the next appointment. This is termed as avoidance behavior.

Omission

Omission or time-out is a type of contingency management where the pleasant stimulus is removed. The objective of removal

is to increase the chance of occurrence of the desired behavior. The presence of the mother or the child's favorite toy could be a pleasant stimulus for the child during the dental procedure. When the child does not exhibit the desired behavior, the dentist can suggest sending the mother out of the operatory or removal of the child's favorite toy until the desired behavior is achieved. Omission or parental separation may be used to reestablish the proper child-dentist-parent relationship. Once the parent is asked to leave the operatory and the child adjusts to the new relationship, the parent may return. If the child shows undesirable behavior again, the parent is asked to leave.⁶³ This scenario may have to be repeated a couple of times. The decision to remove the pleasant stimulus is always with the child. If the child behaves well, the withdrawal of the pleasant stimulus can be stopped, and this works on the principle of operant conditioning.

Voice Control

Voice control is an aversive technique that involves an alteration in the volume, pace, or tone of the voice with the specific intent of gaining the attention of the child and reducing the disruptive behavior.^{82,83} Many dentists in the US reported that they were comfortable using voice control⁸⁴ and used it frequently.⁸² Dentists in the US indicated that voice control was the first choice and preferred mainly over the controversial and now unacceptable hand-over-mouth exercise (HOME) as a BMT.⁸⁵

Though a useful tool,⁸³ its level of acceptance varies. Parents from Israel³³ to Brazil⁸⁶ strongly supported the use of voice control. Nonetheless, it was the least accepted behavior management technique by parents from the US⁸⁷ and Saudi Arabia.⁸⁸ This could be attributed to cultural factors and changing societal expectations and norms.

Using a raised voice must be used with caution, because though it may gain compliance in the dental chair, it may lead to lasting feelings of resentment and distrust toward the dentist in the child's mind. This process may, therefore, be interpreted as more harmful than beneficial when used to manage dental anxiety. Children generally were less accepting of voice control, and those with higher levels of fear, especially, were understandably the least accepting.^{89,90}

In the opinion of the authors, voice control should never be used by dentists when they are not in complete control of their emotions. It should be judiciously used to gain the child's attention and interrupt disruptive behavior only after the dentist and child have spent some time developing a rapport, connecting, and learning to trust each other. If voice control is used with a "friendship" established, to indicate disapproval of the displayed behavior by the child, it would often prompt the child to try and regain approval (of the friend) by ceasing the behavior that resulted in the disapproval. If there were no rapport, no trust, or friendship that existed prior, the use of voice control would possibly be viewed as a loss of control, social powerlessness associated with embarrassment or distrust. Sharath et al. have shown a gradual reduction in the use of aversive techniques like voice control in the subsequent dental visits of the child.⁹¹

Hand-over-mouth Exercise

Home or HOM technique is an invasive, nonpharmacological method used to deal with the disruptive behavior of the child. When the child throws tantrums or displays uncontrolled behavior after all other NPTs have failed, the HOM technique can be used as a last resort to control the undesired behavior and avoid physical

injury. HOM or aversive conditioning is best used in children aged 3–6 years with normal cognitive development.⁶³

In this technique, the dentist places his hand over the child's mouth, then moves close to the child and talks directly into the ear. The child is told to stop screaming and listen. He should be told that we want to talk and look at his teeth. The instructions are repeated, and the child is told to be quiet when the hand is removed. If the desired behavior is not seen, the dentist has to place the hand again on the child's mouth, and the process is repeated. If the desired behavior is attained, the child has to be socially reinforced with verbal praise immediately. Tangible rewards can be given at the end of the dental appointment to instill a positive attitude toward dentistry.⁶³

This technique is a kind of punishment based on operant conditioning theory. In punishment (contingency management), the unpleasant stimulus is presented to the child to reduce the undesired behavior. The use of this technique has become controversial over the years, as dentists in different countries are not in common consensus on its application in behavior guidance. Reasons for the ambiguity in acceptance are due to the harshness of the technique and its potential to cause psychological trauma to the child. Surveys among pediatric dentists in the UK⁸² and USA⁸⁵ found that the acceptance of the use of HOM ranged from 40 to 50%. The HOM technique has not been included or has rather been removed from the list of basic BGTs by the American Academy of Pediatric Dentistry (AAPD) over the past years. In the Indian scenario and from the author's experience, it can be concluded that the use of this technique can be applied judiciously, with consent from parents. It is generally used in the first or earlier dental visits to gain the child's attention and tackle disruptive behavior. It has been shown that the use of HOM decreased over subsequent visits in an Indian structured postgraduate dental program.⁹¹ Indian parents who believe in the use of strict or stringent punishments for the betterment of their child's attitude and behavior do agree to the use of this technique.

Protective Stabilization

Protective stabilization is the restriction of the patient's freedom of movement, with or without the patient's permission, to reduce the risk of injury and allow the safe completion of treatment. The objectives of patient stabilization are to reduce or eliminate untoward movement, protect patients, staff, dentists, or parents from injury, and facilitate the delivery of quality dental treatment.³⁶ It can be broadly classified into (1) active, when the dentist or other dental personnel are involved; (2) passive, when other devices are used for immobilization; and (3) a combination of both. In the active method, multiple people are usually involved in stabilizing the child. The passive method uses specific devices to stabilize the head, body, and extremities. The use of a mouth prop in cooperative children is not considered protective stabilization. Partial or complete stabilization is performed by the dentist, staff, or parent with or without the aid of a restrictive device to protect the child, dentist, and parent from injury while providing dental care. The use of the least restrictive, safe, and effective protective stabilization is warranted.⁹² Consent must be obtained from the parent or caregiver before the use of protective stabilization. Protective stabilization was previously called physical restraints or medical immobilization. The terminology physical restraints, previously used, was too harsh, as the intent was not to restrain the child but to protect the child and dental team.

Modeling

Experience over the years has taught us that children are never good listeners; they are excellent imitators. Modeling is based on Bandura's social learning theory. It is built on the idea that children can be taught a behavior by getting them to observe and imitate other children demonstrating a particular desired behavior,⁹³ in a similar setting without any reaction of fear or aversive consequences.^{94–96} The desired behavior can be presented to children live by getting them to observe a sibling or another child receiving dental treatment directly. Alternatively, a recorded version may be provided for viewing on televisions, computers, or handheld devices. Recorded modeling can be considered an economical method as it does not require extensive chairside time.⁷⁸

Modeling might be incredibly productive with children who have not had previous exposure to dental treatment⁹⁷ and with preschoolers. Children relate themselves better to the coping model rather than the mastery model. The coping model makes an effort to deal with the unpleasant experience, succeeds, and is rewarded for the same. The mastery model seems to effortlessly breeze through the appointment, making it a little unrealistic to a child who is having a hard time dealing with DFA.

Retraining

Retraining is a behavior modification technique that includes avoidance, de-emphasis or substitution, and distraction. If the child is given the options for dental treatment (for that appointment) and the child chooses restoration of a tooth over the extraction of another tooth, the child has avoided a particular fearful stimulus. If the high-speed handpiece is substituted with a slow-speed handpiece or a spoon excavator on request from the child, the fearful stimulus has been de-emphasized. Disruptive behavior can be controlled by distracting the child's attention and engaging them in alternative activities.⁷⁴

Distraction

Distraction is a technique of diverting the child's attention from what may be perceived as an unpleasant procedure. Beneficial distractors could be employed effectively at any point during the dental visit. This could be either before the actual dental appointment begins by allowing the child to get involved in some kind of play activity while in the reception, waiting, or play area; at the beginning of the appointment during the initial verbal interaction (by engaging the child in a discussion about a pleasant topic); or while seated in the dental chair during the dental appointment by asking the child to visualize a pleasant experience or giving the child a counting task (in mind). If we observe the child playing with a toy in the waiting area, it is likely that the toy also serves to distract the child in the dental chair.⁹⁸ Letting the child hold a toy or mirror, which acts as a distractor, has also been used as a technique for managing anxious or difficult children.⁹⁹ Distractions can be of two types: active and passive, based on the involvement of the child. Children who were given the option to choose between a range of audio distractions (e.g., music, soundtracks, audio stories) were less uncooperative and more satisfied than the control group.¹⁰⁰

Contingent distraction, which allows the child access to a distractor such as a personal music player or a favorite toy for cooperative behavior and is removed for uncooperative behavior during the dental appointment (omission), resulted in lower levels of disruptive behavior.^{101,102} The audiovisual distraction technique was more effective in managing anxious pediatric dental patients compared to an audio distraction technique.¹⁰³ The 3D video glasses

Table 2: Behavior guidance based on different levels of DFA

Low levels of dental fear or dental anxiety	Less volume of treatment required Less complex treatment is required	<ul style="list-style-type: none"> Establishing a trusting relationship Magic tricks/story-telling/drawing and coloring TSD Positive images/positive reinforcement Modeling/voice control/distraction/relaxation/memory restructuring
Moderate levels of dental fear or dental anxiety	More volume of treatment is required More complex treatment (acute or painful) is required	<ul style="list-style-type: none"> Distraction, relaxation May also require more intensive interventions such as helping them develop coping strategies Retraining Specific pharmacological support (nitrous oxide-oxygen inhalation sedation/oral sedation)
High levels of dental fear or dental anxiety	More volume of treatment required More complex treatment (acute or painful) required Urgent treatment required	<ul style="list-style-type: none"> Complementary use of pharmacological and psychological approaches, especially cognitive behavioral therapy For acute and urgent dental care: conscious sedation or IV sedation or general anesthesia For high levels of anxiety/phobia: systematic desensitization/hypnosis/cognitive restructuring/cognitive behavioral therapy

were found to be superior to music as a distractor, and children who experienced treatment with administration of local anesthesia with 3D video glasses reported higher levels of satisfaction.¹⁰⁴ Virtual reality distraction was better than counterstimulation in reducing anxiety to injection in children undergoing extraction and pulpectomy.¹⁰⁵

Memory Restructuring

In memory restructuring, memories associated with a negative or difficult event (e.g., first dental visit, local anesthesia, or extraction) are restructured into positive memories.¹⁰⁶ Restructuring is done after the event has taken place and involves four components: (1) visual reminders, for example, a photograph of the child smiling before the negative event; (2) positive reinforcement through verbalization, for example, the child is asked to role-play and tell her parent about the good job she had done in her last appointment; (3) concrete examples, for example, use of social reinforcers (descriptive praise) to appreciate the specific desired behavior of the child; and (4) sense of accomplishment—making the child demonstrate these behaviors gives her a sense of accomplishment.³⁶

In the author's experience, this behavioral approach is similar to reframing the child's mind and hence has been explained here. Reframing is defined as "taking a situation outside the frame that up to that moment contained the individual in different conditions and visualize (reframe) it in a way acceptable to the person involved, and with this reframing, both the original threat and the threatened "solution" can be safely abandoned." Successful reframing converts unpleasantness to acceptable notions to the parties involved.³³ It is based on the principle that the content of any event depends upon the frame in which one perceives it. A change in the frame changes the content, which in turn changes the response and behavior of the person. Reframing can be achieved either by changing the meaning or sense of the situation or by changing the context. Nuvvula et al. have successfully treated lip-biting habit in a 10-year-old child using the principles of reframing.¹⁰⁷

Behavior Guidance Based on Different Levels of Dental Fear and Anxiety

Children and adolescents vary considerably in competence, maturity, personality, intellectual capacity, temperament, emotions,

experience, oral health, family background, parenting styles, and culture. This, coupled with the factors (within and without the dental setting) that influence the levels of DFA and types of DBMP, must be considered while choosing the most appropriate BGTs (Table 2).

The objectives being:

- Minimize DFA and DBMP.
- Positively shape and guide the behavior of the child.
- Facilitate the delivery of high-quality dental care.
- Help both the child and parent develop a positive attitude toward dental health and treatment.¹⁰⁸

CONCLUSION

These guidelines are not a rulebook or a legal document. They are a representation of the various nonpharmacological methods, processes, and techniques that may be available and can be used in the dental health care setting to help fearful children better cope with and progress through the dental appointment.

It may be safely concluded that there is a consensus on the fact that the behavior of the child is a key determinant in the successful treatment of the child. Over the years, there have been numerous methods/techniques available to dentists/pediatric dentists who have taken on the responsibility of providing dental care for the child. Some of these techniques are universally accepted. Other techniques have to be adapted or modified to suit the age of the child, sociocultural background, skill/comfort of the dentist, and acceptance by the parents.

It may be considered prudent that all who assume responsibility to provide dental care for children equip themselves with the requisite knowledge and skill set that will enable them to alleviate anxiety and fear that a child might experience in the dental setting. While trying to change the behavior of children, the focus has often been solely on the child; however, involving the parents or caregivers to a greater extent and making them an integral part of the desired change may serve a greater purpose, keeping in mind the influence that the parents would have in the decision-making for the child.

Also, while most attempts to positively influence children's behavior would focus on the "techniques," the child and parent would be better served if the approach were more holistic, with the children being the focus and the cause of the disruptive behavior understood. Then there would be the need for far fewer behavior management "techniques." In conclusion, it is essential to shape, modify, and guide the behavior of the child and, at times, the parent too. The successful pediatric dental practice delivers high-quality dental care while creating a positive attitude toward dentistry, both in the mind of the child and parent(s).

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