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Intentional mistake distraction: An innovative technique for distracting children during dental treatment: A case series

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ABSTRACT

Introduction: Despite the introduction of numerous behavioral techniques, pediatric dental treatment is still a complex challenge for the dental team and families. The aim of this study was to introduce the innovative method of "Intentional mistake distraction" and to compare its effectiveness with the "common distraction" technique in the dental treatment of 3 pediatric patients.

Case description: In this case series, 3 cases, including 2 boys and 1 girl, were treated using the behavioral methods “Intentional mistake distraction” and “Conversational distraction” in a crossover (splitmouth) design. The children's behavioral responses were assessed at the time of local anesthetic injection and during tooth extraction using the Sound Eye Motor (SEM) scale. The results showed that the samples had lower scores during treatment with the “Intentional mistake distraction” method than during treatment using Conversation distraction.

Conclusion: Considering the lower behavioral responses of children when using *Intentional mistake distraction* compared to Conversational distraction when applying painful stimuli, it seems that this technique can promise effective results in guiding children's behavior.

Keywords: Behavior, Pediatrics, Dentistry, Anxiety, Pain

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Introduction

Despite developments in pediatric dentistry, the prevention of dental anxiety remains a challenge that hinders the provision of high-quality dental services. [1, 2] A wide range of

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pharmacological and non-pharmacological approaches have been introduced for the management of dental anxiety in pediatric dentistry, with non-pharmacological approaches proving to be more acceptable to parents.[3]

Distraction is a common non-pharmacological behavioral technique for pain reduction. It redirects the child's focus from their ability to cope with painful stimuli to something more engaging, thereby reducing pain and anxiety. Conversational distraction is considered the most effective form of distraction.[4] The use of music, 3D glasses, and multimedia distractions is another form of these behavior management methods. [3, 5-7] More recently, integrated behavior management methods have been introduced in studies. “Thaumaturgy,” “Bagherian,” and “Prize-distraction” techniques are examples of such techniques that have reported positive results in reducing anxiety in children during painful dental procedures.[8-10]

The *‘Intentional mistake distraction’* is a modified technique of the most common distraction method, namely conversation, introduced by a pediatric dentist. This method is based on the dentist making an intentional mistake in the concepts of conversation and is designed to get the child's attention to correct this mistake or answer the dentist's wrong question. The method consists of the dentist, while applying a local anesthetic or other painful stimulus, attempting to talk about a topic he or she has previously discussed with the child. The crux of this method is that the dentist intentionally misstates or inverts the topic in their dialogue with the child.

At the same time, it is expected that the child's attention will be diverted from the painful/anxious stimulus by this method in order to correct the dentist's incorrect speech. This topic may be the child's age, the name of the school, the number of siblings, or any other personal topic related to the child. As ‘intentional mistake distraction’ is a new and recently introduced technique, its effectiveness in pediatric dentistry needs to be investigated. The aim of this study was to treat three pediatric dental cases with the intentional mistake distraction technique and compare its effectiveness with the common conversation technique.

Case Description

The study was approved by the Ethics Committee of the Arak University of Medical Sciences (IR.ARAKMU. REC.1403.110). This study describes 3 different cases. All children and their parents were briefly informed about the project, and the parents of all 3 cases gave their consent for publication of the article.

Case 1: A 6-year-old boy presented to a private pediatric dental practice complaining of pain and an oral abscess in the anterior mandibular molars (right and left). Both teeth were candidates for extraction due to severe external root resorption on radiographs of teeth 74 and 84. The child was systemically normal and the parents reported no history of dental treatment. After determining the child's dental treatment plan and performing the conventional Tell-Show-Do (TSD) technique, the child's cooperation was rated 4 (completely positive) on the Frankel Cooperation Scale.

The treatment of tooth 74 was carried out in the first session using the 'intentional mistake distraction' method and the treatment of tooth 84 in the next session using the "conversational distraction" method in the form of a pediatric dentist telling the story of the tooth germs (oral cleft method). Other methods of behavioral guidance were similar in the two treatment sessions. Distraction methods in both sessions, during local anesthesia, were applied by infra-alveolar

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nerve block (t_1) and during tooth extraction (t_2), including the steps of soft tissue separation and hard tissue removal of the tooth. Before starting the tooth extraction, the dentist made sure that the anesthesia was completely successful.

The pain assessment criterion of the Sound Eye Motor Scale (SEM) was measured and recorded at time points t_1 and t_2 by a trained observer (Table 1). This observer was not blind, as she became unconsciously aware of the distraction technique by hearing the dentist's words. The SEM pain assessment criterion calculates and scores the smallest expression of the patient's eyes, sound or movement during the application of a painful stimulus. In the first treatment session, accompanied by the 'intentional mistake distraction' method, the child showed no behavioral reactions during the application of local anesthesia and tooth extraction, while the negative reaction was evident when the conversational distraction method was applied during tooth extraction: the child complained loudly of pain, his eyes became wet, and brief hand movements occurred. (Score 2 SEM Scale) Table 1.

Table 1: SEM scores at time points t_1 and t_2 while using the "intentional mistake distraction" and "conversational distraction"

SEM scores		conversational distraction	Intentional mistake distraction
Case 1	t_1	0	0
	t_2	2	0
Case 2	t_1	1	1
	t_2	1	0
Case 3	t_1	0	2
	t_2	-	-

(t_1: during inferior alveolar nerve block injection, t_2: during tooth extraction)

For the use of intentional mistake distraction during the insertion of local anesthesia (t_1), the dentist had previously learned from his conversation with the child that he had a 2-year-old sister. While applying local anesthesia, the dentist repeatedly asked the child, "Did you say you have a little brother?" At this point, the child's attention was completely focused on the dentist's conversation and he tried to show the dentist a negative answer by moving his eyes and eyebrows. During the local anesthesia procedure, the dentist then asked the next question. "Oh, I wasn't paying attention, so you have two brothers, right?"

Again, the patient's eyes and eyebrows reacted negatively, and finally the dentist's last sentence: "Oh, I think you said you had a sister!" and the child's head and eyes moved slowly, confirming the dentist's statements. When using intentional mistake distraction during extraction (t2), the dentist intentionally asks the child's age incorrectly. "Honey, did you say you were 8?" (Although he already knew that the child was 6 years old). At this point, the child becomes aware of the dentist's verbal error and tries to draw the dentist's attention to his mistake by imitating his face. At this point, the dentist says his next sentence. "Oh, did you say you were

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4?" At the same time, the extraction movements are performed and immediately after the tooth is extracted, the dentist corrects his mistake: "Oh, I forgot you said you were 6 years old." **Case 2:** A 9-year-old girl was referred to the pediatric dentist's office to have teeth 73 and 83 extracted per the orthodontist's instructions. The child was systemically normal, but dental history indicated the extraction of maxillary anterior teeth about 3 years ago. According to the parents, the child did not cooperate well during the treatment and the treatment was accompanied by crying and active immobilization. The child did not have a good memory of visiting the dentist and was very afraid of local anesthesia. For this reason, in addition to the first visit with the child, a second visit was arranged to perform the TSD technique, anxiety reduction and relative improvement in the child's behavior.

In the first treatment session, tooth 83 was extracted using the "Conversation" distraction method and in the second session, tooth 73 was extracted using the "intentional mistake distraction" method. In this case, the intentional mistake distraction and conversational distraction techniques were performed exactly as in case 1 at time points t_1 and t_2. In the first treatment session, the child widened his eyes and slightly clenched his hands during the application of local anesthesia (t_1), which was rated 1 on the SEM scale, despite having gained the child's trust during previous visits; during the extraction (t_2), a non-specific and indistinct sound was heard simultaneously with the widening of the eyes (SEM score of 1); in the next treatment session using the "intentional mistake distraction" method, the same numbers were recorded at time t_1 as in the previous session, but at time t_2, the child's behavioral responses decreased Table 1.

Case 3: A 5-year-old girl presented with a complaint of food impaction around teeth 84 and 74; the child was systemically normal and had no dental history. After history taking and clinical and radiographic examinations, both teeth were diagnosed as candidates for pulpotomy and stainless steel crowns. After performing the TSD and assessing the child's behavior, it was determined that the child's cooperation was at level 2 of the Frankel classification. In the first treatment session, tooth 74 was treated using the "Intentional mistake distraction" method. The dentist had previously learned from talking to the child that he had a 2-year-old sister. While applying the local anesthesia, the dentist repeatedly asked the child: In this case, the intentional mistake distraction technique was performed exactly as in case 1 at time t1. The child showed no negative reaction and scored 0 on the SEM scale. (Table 1) In the next session, treatment was performed on tooth 84. Concurrent with Conversational distraction during local anesthesia, the child was completely curious and complained of pain when the anesthetic needle was inserted. (Score 2 on the SEM scale)Table 1.

Discussion

Creating a good memory of the dental visit is one of the most important goals of pediatric dentistry. Despite many advances in pain control, "dental anxiety" is still a major challenge in dental treatment, especially in children. [11]

The most basic form of distraction is to talk to the dentist. [12] "Telling a story", "asking permission", "counting and interrupting", and "playing" are common distraction methods that the dentist can use. [11] Several methods have now been introduced in the field of behavior management of children, but it seems that the time has come to integrate these techniques to increase the effectiveness so that the benefits of several methods of behavior management can

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be used simultaneously and behave more effectively. Bagherian [9] invented and introduced the cotton-roll vibration as a form of distraction technique. Sarlak also introduced the “prize distraction” technique as a combination of "distraction" and "positive reinforcement" methods.[10]

In the current study, the *intentional mistake distraction* method was introduced and applied, a simple technique that is easy to learn and practical to use. This form of conversation includes these sentences:

"Darling, did you say you were in second grade?" After drawing the child's attention to the dentist's false statement and possible reaction with the facial parts during stimulation, the next step is to say, "Oh, so you said you were in fourth grade?" Again, the child's attention is drawn to the dentist's speech mistake. The effort to correct the dentist's mistake is expressed in facial movements or vocal reactions. Then, the dentist's correct statement: Oh my friend, I just remembered you said you were in the third grade. When performing this distraction method, the clinician takes care to apply local anesthesia or other stimuli slowly and as pain and pressure-free as possible, and not to neglect other methods of pain and anxiety reduction.

The logic and basis for the invention of this method is that the dentist's use of false statements in this method is likely to result in increased attention from the child, perhaps as equally or more effectively than any other distraction method yet introduced. It appears that in this method, the child listens more actively to the dentist's words while committing to responding (confirming/rejecting) to his words, and that his attention is diverted away from the pain/anxiety-inducing stimuli throughout the conversation.

The results of this study showed that *intentional mistake distraction* was more effective in reducing children's pain and anxiety than the traditional "conversational distraction” method, such that children showed fewer behavioral responses when exposed to two anxiety/paininducing stimuli, including local anesthesia as the main stressor of dental visits and extractions, and as a result experienced more comfortable treatment. However, due to the small number of samples and the lack of statistical analysis, these results cannot be considered significant and meaningful.

In the present study, the SEM scale was used as an objective scale to assess the children's behavioral responses during stimulus application, since the children's responses in self-report scales are questionable. [5]

The author of this article, has experienced the effectiveness of this method in successfully guiding children's behavior. Considering the proven effectiveness of using different methods of behavior management in pediatric dentistry, it seems that combining two or more behavior management techniques can increase effectiveness and provide desirable and enjoyable dental treatment for children. However, since the present study, as the first article presenting the intentional mistake distraction method, is a case series, it is suggested that the efficacy of this innovative method, as well as its challenges and drawbacks, be evaluated in clinical trials conducted by other researchers and in different age groups. It is necessary to conduct clinical studies with careful design and adequate sample size to determine the effectiveness of this method in different age groups, while analyzing the indications and challenges of this method.

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Conclusion

It seems that *intentional mistake distraction* can be considered in the area of guiding children's behavior during dental procedures and reducing their pain and anxiety. More comprehensive studies are needed to prove the effectiveness of this technique.

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Conflicts of Interest

All authors declare no conflict of interest.

Author's Contribution

Hamid Sarlak developed the original idea and protocol, summarized the data, drafted the manuscript, edited the article, and supervised the project. Afrooz Nakhostin analyzed and summarized the data, drafted the manuscript, and edited the article. Sanaz Valipour Shookuhi collected and summarized the data, drafted the manuscript, and edited it

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