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# PEDIATRIC DENTISTRY AND DENTAL ANXIETY

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**ABSTRACT**

Anxiety is a state of intense restlessness and anxiety that occurs subconsciously against an unknown danger. The person who experiences anxiety will have something bad at any time and they will feel hurt and experience fear without reason. Its formation dates back to childhood and can continue in adulthood. Dental anxiety, on the other hand, is defined as the intense concern of the patient for all kinds of dental procedures. Dental anxiety against dentists and dental treatments is one of the problems affecting dental treatment. Children with high anxiety levels and uncontrollable increase in oral-dental health problems. In preventing this increase, the reasons causing dental anxiety should be determined. Dental anxiety can occur for individual or environmental reasons. While the child's own psychology is influenced by individual reasons, poor dental procedures in the dental of environmental origin or the experiences gained play an important role. The most important factors are the negative approach of the family to dental treatment, the preparation process for home treatment, low socioeconomic level, the child's age and the dental stories of the child's friends. The methods used in determining dental anxiety in children are psychometric, physiological, projective tests and scoring behaviors. In determining these methods, it is selected according to the child's age and level of development. In the success of dental treatment in children, determining the level of dental anxiety of the child is important in the application of appropriate behavior guidance technique.

## Introduction

Dental anxiety; It can be defined as the intense anxiety of the patient, who does not have a specific source, against all kinds of dental procedures. Dental anxiety also has physiological, cognitive and behavioral components (1).Dental anxiety is associated with internal (individual) or external (environmental) factors (2).External dental anxiety; It is a type of phobia that occurs directly or indirectly due to poor dental treatment or acquired experience (2).Internal dental anxiety; It is defined as a personality trait or internal (individual) anxiety and depends on the individual's own psychology rather than the direct effect of dental treatments (2).

These types of anxiety observed in children in dental procedures are summarized in 2 ways;

1. Individual Anxiety (Personal): Individual anxiety is simply an emotion inherent in some individuals. Children with this type of anxiety reflect their worries and fears in their dental treatments as well. The more anxiety the child has at the first appointment, the more he / she will maintain the same level of anxiety in the follow-up appointments (3).

2. Maternal Anxiety: It is a type of anxiety caused by the mother. Until today, dental examinations and examinations taken by their mothers bring to mind the question of whether there is an effect of maternal anxiety on dental anxiety. Indeed, it has been reported that maternal anxiety affects the behaviors of young

children during the first dental examination and treatment (4).

Prevalence of Dental Anxiety: In a study conducted in our country in the 7-11 age group, 14.5% of children were reported to have dentist anxiety (5). In the study conducted by Doğan et al. (6) in 2006, it was stated that 19% of children had dental anxiety. In another study conducted in our country, it was determined that 30% of children in the 3-6 age group and 11% of children in the 7-12 age group have dental anxiety (7). In a study involving 147 pediatric patients living in the southern region of Madrid; The prevalence of dental anxiety was determined as 13.6% (8), 20.6% (9) in Taiwanese children aged 5-8, and 5.7% (10) in 1281 children aged 6-8 years in Denmark.

***Symptoms of Dental Anxiety:***

The effective and reliable assessment in understanding the verbal and non-verbal behavioral findings (general posture, speech function and shape, sitting in the photo) are observation and communication. However, in cases where these are insufficient, the patient can report to the physician via verbal or written forms (11).

The first sign of dental anxiety is delaying an appointment. The appointment made changes frequently and the patient presents very important obstacles (12, 13).

Anxiety symptoms of the patients in the clinic:

 Changes in breathing (irregular breathing, sighing, and shallow breathing)

 Tightening of teeth and jaw, tension in muscles and stiffness in extremities.

 A talkative person becomes silent or someone who is quiet starts talking too much

 Frequent spitting, mouth rinsing during the procedure

 Stopping the physician from working by holding his arm,

Discomfort symptoms such as the inability to sit still,

 Panic attack or fainting (14, 15).

Apart from these, some patients do not show any symptoms of anxiety; however, they experience panic as they seem to overcome this (13, 15).As a result of various studies, somatic symptoms observed in individuals in the presence of dental anxiety:

 Strengthening and increase in heart rate,  Arrhythmia, Extrasystole,  Increase in blood sugar, yüksel Increase in the electrical resistance of the skin,  Vomiting,  Tremor (shaking in the hands),  Sweating,  The need for toilet due to overwork of the kidneys,  Vasoconstriction in blood vessels,  Growth in pupils,  Increase of systolic blood pressure,  Epinephrine and cortisol secretion from adrenal glands. Stomach spasms,  Pain, the feeling of choking or choking in the respiratory system,  Hyperventilation,  Piloerection (prickling of the hairs),  Dry mouth due to a decrease in the function of the salivary glands,  Diarrhea,  Hyperemia due to dilatation in the peripheral vessels (16).

***Dental Anxiety Etiology:***

Baier et al. (17) stated in their study that the etiology of dental anxiety in children was multifactorial. Etiological factors of dental anxiety in children; It can be examined in 3 parts as "individual factors, environmental factors and dental factors".

1. Individual Factors: Age (18, 7, 9, 19,20), Gender (9, 19, 21-23), Personality Traits (24), Communication Skills (18), Neuropsychiatric Problems (25), Injury, Injection and Blood Phobia ( 26),

2. Environmental Factors: Familial Factors (27), Parents' socioeconomic status and educational status (28,29).

3. Dental Factors: There are some studies indicating that there is a relationship between dental experience and anxiety (30-33). The physician's clothing, age and gender (34,35), seat position, and what type of dental treatment is applied (36) are among the factors that affect anxiety (21,37,38).

4. Other Reasons: Psychological importance of the mouth, Uncertainty about the dental intervention to be applied, Sense of loss of control.

***The Relationship Between Dental Anxiety and Oral-Dental Health:***

Some studies have indicated that the number of missing and problematic teeth is higher and the number of restorated teeth is lower in patients with high dental anxiety (39-41). It has been reported that high dental anxiety affects the oral health of individuals and therefore causes negativity in their quality of life (42).

Dental anxiety is a condition that often results in patients delaying their appointments. In fact, it is one of the biggest and most important obstacles to treatment. However, delaying or reducing the patient's visit to the dentist increases the frequency and severity of the disorders. In this way, the patient is in an impasse and treatment becomes more difficult with the growth of the problems . Studies have shown that the number of missing and problematic teeth is higher and the number of restorated teeth is lower in patients with high dental anxiety (43-45).

In the study of Kakkar et al. (46) in which they investigated the effects of dental anxiety in children aged 10-14, they found that patients with high dental anxiety had more caries, missing or filled tooth surfaces. Yahyaoğlu et al. (47) found a significant relationship between anxiety and tooth decay in their study on 810 children aged 6-12 years. Locker and Liddell (48), in their study comparing patients with dental anxiety and patients without anxiety, found that individuals with high levels of anxiety had more missing teeth and had almost 5 times more urgent treatment needs to eliminate the infection.

In a study conducted on 1745 children aged 5 years in England, it was reported that children with dental anxiety had statistically significantly more caries than others, did not attend their treatments regularly, had parents with higher anxiety and had tooth extraction in the past (49). Raadal et al. (50) reported that children with many decayed teeth at the age of 5 years were likely to have high dental anxiety when they reached the age of 10. In another study, a significant relationship was found between dental anxiety and DMFS (Decayed Missing Filled Surface Index) scores in 275 children aged 7-11 years, and it was reported that as the DMFS values increased, the dental anxiety levels in children also increased (51 ).

In the study conducted by Torriani et al. In Brazil; They reported that children with DMFS scores 2 had a higher level of dental anxiety compared to children in the group without caries, and 70% more fear of dentists in children who never went to dentist control (52). In a study conducted with French children aged 5 -12 years, it was reported that a higher level of dental anxiety was observed in children with at least one active caries compared to those without caries (53).It has been reported that high dental anxiety affects the oral health of individuals and thus causes negativity in their quality of life (54).From the point of view of oral and dental health, dental anxiety is a serious threat. Therefore, it is very important to detect and eliminate the presence of dental anxiety, especially in children, in order to increase the quality of life. Studies show that if this situation is not resolved, it can be passed on to the next generations (55).

***Evaluation of Dental Anxiety:***

There are many methods for determining dental anxiety, such as physiological, psychometric, projective tests, and observing and scoring behaviors.

Frankl Behavior Scale (56); Yale Preoperative Anxiety Scale (57); Sitting Pattern Test can be included in the scoring method of behaviors.

***Projective Methods:***

In this method, figures or pictures are shown to children to determine the emotions they feel (58,59). Venham Picture Test (VPT) (60,61) Facial Image Scale (FIS) (62,63).Psychometric Tests: Modified Children's Dental Anxiety Scale, Corah Dental Anxiety Scale, Modified Dental Anxiety Scale, Spielberg's State-Trait

Anxiety Inventory, Dental Fear Scale, Dental Sub-Scale of Fear Research Program in Children.

***Physiological Methods:***

In the respiratory system (breathlessness, feeling short of breath, etc.), sweat glands (increased sweat production and electrical conductivity in the skin), muscles (increased muscle tone, spasmodic movements, etc.), in the digestive system (dry mouth, constipation, etc.) and Changes occur in the cardiovascular system (increased blood pressure and pulse).For these reasons, in physiological methods; It can obtain information about anxiety level by measurements such as blood pressure, oxygen saturation (SpO2 - Saturation of Peripheral Oxygen), heart rate and fingertip sweat index (64).

***Dental Anxiety Control:***

In the American Academy of Pediatric Dentistry (AAPD) guideline on behavioral guidance in pediatric patients published in 2015, different behavioral orientation techniques for dental anxiety control were specified (65). These techniques can be evaluated under 2 headings:

***BASIC BEHAVIOR ORIENTATION TECHNIQUES:***

1) Directing Communication, Pre-Treatment Visual Support, Direct Observation, Tell-Show Apply, Ask-Explain-Ask, Voice Control, Non-Verbal Communication, Positive Encouragement and Explanatory Praise, Distraction, Shaping Experiences, Parental Presence / Absence

2) Nitrous Oxide / Oxygen Inhalation

***ADVANCED BEHAVIOR ORIENTATION TECHNIQUES:***

1) Guard Fixing

2) Sedation

3) General Anesthesia

The methods to be applied to direct communication in the dental treatment processes of pediatric patients are very important. It requires communicating to a level that the child can understand, using simple and warm words.

Pre-Treatment Visual Support: It is the form of showing positive dental treatment photos to patients and parents in the waiting room before dental treatment (66).

Direct Observation: This method provides patients with; In the form of observing patients undergoing dental treatment or watching videos of these patients (67, 68).

Tell-Show-Apply: It is the technique that has been valid for years and is the most accepted by parents and it is stated that this technique is a successful method on the child (69). Technique is defined as explaining the work to be done before doing anything and explaining exactly what will happen with various similes before the procedure begins (70).

Ask-Tell-Ask: This technique allows the patient to get information (ask) about the visit and any planned procedure or dental treatments to be performed; to explain the treatment procedures in a language that is appropriate and non-threatening to the patient's cognitive level; and again, asking how the patient feels about the upcoming treatment. (71).

Sound Control: It is the deliberate and cautious change of the loudness and tone of the child in order to establish the appropriate authority relationship between the child and the physician, to create an appropriate parent-child role model, to prevent the child's negative and incompatible behaviors and to attract the attention of the child (72).

Nonverbal Communication: It is the reinforcement and direction of behavior, usually through the physician's facial expression, posture, posture, eye contact, and body language (72).

Positive Encouragement and Explanatory Praise: It is based on the principle of giving reinforcers stating that the harmonious behavior expected from the child during dental treatment is appreciated and appreciated by the physician (72).

Distracting the Attention: It is based on the technique of diverting the attention of the child by taking a break from an unpleasant procedure, or by taking a break from a stressful procedure (72).

Shaping Experiences: It is the behavior of shaping the negative dental experiences of the patient with positive experiences by using the information suggested after the event occurs (72).

Parental Presence / Absence: It is still a controversial issue whether the parents are present or not with the child during the treatment. There is no clear information about this issue, no conclusion about how old should a parent be, etc. However, changing social expectations show that parents now want to be with their children during treatment (72, 73).

2) Nitrous Oxide / Oxygen Inhalation: It is the nasal inhalation of Nitrous Oxide / Oxygen through a mask. It is quick to act, the effects are easily titrated and reversible, and recovery is rapid and complete.

It can be used to reduce anxiety, reduce opposing movements, increase tolerance to long-term procedures, help patients with mental, physical or medical problems and patients with high nausea reflex. (74). There are 3 methods under the title of Advanced Behavior Guidance Techniques in the AAPD's manual published in 2015:

Protective Fixation: It is done in order to reduce the opposing movements by fixing a part or the whole of the body of the patient, to protect the patient and staff from injuries and to facilitate treatment (74).

Sedation: It is the condition of reducing or eliminating anxiety with the use of sedative agents before or during the operation. Protective reflexes do not disappear and the patient responds to verbal commands. It is indicated in ASA I and ASA II patients who do not comply with the treatment or who do not comply with the treatment due to physical, mental and medical disabilities (74).

General Anesthesia: General anesthesia is unconsciousness and loss of pain sensation as a result of deeper sedation. Requires the use of general anesthetic agents (intravenous, intramuscular, inhalation) for intraoperative care. It is indicated for patients with medical, physical or mental disabilities, in cases where local anesthesia is not effective due to acute infection or allergies, excessively incompatible, fearful patients, and extensive dental / oro-facial trauma (74).

## Conclusion

Dental anxiety against dentists and dental treatments is one of the problems affecting dental treatment. There is an increase in oral and dental health problems in children whose anxiety level is high and cannot be controlled.

The methods used in determining dental anxiety in children are psychometric, physiological, projective tests and scoring of behaviors. In determining these methods, they are chosen according to the child's age and development level. For the success of dental treatment in children, it is important to determine the dental anxiety level of the child in the application of appropriate behavioral guidance technique.

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