

Republic of Iraq
Ministry of Higher Education
and Scientific Research
University of Baghdad
College of Dentistry



Dental fear and anxiety among pediatric patient

A Project Submitted to

The College of Dentistry, University of Baghdad,
Department of Pedodontics and Preventive dentistry
in Partial Fulfillment for the Bachelor of Dental Surgery

by

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2023 A.D

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Certification of the Supervisor

I certify that this project entitled "Dental fear and anxiety among pediatric patient "was prepared by the fifth-year student **Haider Latif Ensaeef** under my supervision at the College of Dentistry/University of Baghdad in partial fulfillment of the graduation requirements for the bachelor's degree in Dentistry.

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June, 2023

DEDICATION

I'D LIKE TO DEDICATE THIS PROJECT TO **MY MARTYR FATHER** AND TO MY **BELOVED MOTHER** WITHOUT BOTH I WOULD NEVER MAKE IT TO THIS POINT.

TO ALL MY **FRIENDS**, THANK YOU FOR BEING ALWAYS THERE FOR ME WITH ALL YOUR LOVE AND SUPPORT.

Acknowledgment

First, "**Alhamdulillah**" for give me the strength, and patience to accomplish this work, and I pray that His blessings upon me continue throughout my life .

Grateful thanks to **Prof. Dr. Ragad Abdul_Razaq Al-Hashimi** , Dean of the College of Dentistry of Baghdad University. My deep thanks to scientific assestant Dean **Prof. Dr. Ali Al-bustani**.

Grateful thanks to **Assistant prof. Assel Haidar.**, Head of the Department of Pedodontics and Preventive Dentistry, for her support.

My sincere gratitude and deepest respect go to **my Supervisor Lect. Noor Ahmed**, for her guidance, kindness, high ethics, support and continuous helpful advice throughout my study.

I would like to thank the staff in Department of Pedodontics and Preventive Dentistry, College of Dentistry, University of Baghdad.

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LISTE OF ABBREVIATIONS

DF Dental Fear
DA..... Dental anxiety
CBT.....COGNITIVE BEHABIOR THERAPY

Introduction

Dental fear and anxiety (DFA) are problems that dentists encounter on a daily basis when working with both children and adult patients. With a prevalence of 9% in pediatric dentistry, they pose a major challenge for any physician who encounters patients of that age (**Klingberg and Broberg, 2007; Dahlander et al, 2019**). In adult patients, they are most often a reflection of previous negative experiences from dental practices that are associated with childhood and adolescence. Dental fear is an immediate and disturbing reaction that arises in response to an individual's reaction to threatening situations or events(**Diercke et al.,2011; Saatchi et al.,2015**). Dental anxiety and fear (DFA) in children has been recognized in many countries as a public health dilemma (**Alvesalo et al, 1993**). Among other physical problems seen after birth and persisting into adolescence, toothache due to dental caries often begins in infant. Despite great progress in dental health through dentistry, most youths require dental treatment of various forms (**Milgrom et al, 1992**). **Holtzman et al, (1997)** found that, patients for fear of dental treatment missed appointments 3 times more than other patients. They did find that as age increased, fear and anxiety decreased, measured through physiological responses to critical reaction symptoms, such as patients' muscle tension when sitting in the dental chair; further, that younger women expressed more DF than older women, while men reporting DF was unrelated to age. Patients with dental fear and anxiety can sometimes make the procedure extremely stressful for dental staff, which, in turn, can disrupt interpersonal relationships in the office, as well as the relationship between the patients, parents and doctors, which is a key factor in solving DFA problems and shaping behaviour in the dental office(**Hakeberg et al., 1993; Klingberg and Broberg, 2007; Brahm et al., 2013**).

Aim of study

Aim of our study to review Acknowledge about fear and anxiety associated with dental treatment in clinic and how to deal with it.

Chapter one: review of the literature

1.1 Dental Fear

Dental fear is a normal emotional reaction to one or more specific threatening stimuli within the dental situation, while dental anxiety (DA) denotes a state of apprehension that something dreadful will happen in relation to dental

treatment, coupled with a sense of losing control. Dental phobia represents a severe type of DA and is characterized by marked and persistent anxiety in relation either to clearly discernible situations/objects (e.g., drilling, injections) or to dental situations in general(Klingberg and Broberg, 2007). Henry Lauth, (1971) investigated whether these patients' fear was related to the nature and the characteristics of dental care. While Elliot Gale, (1972) concluded that clinicians needed to assess the situation of the patient, rather than actual pain under any circumstances, when assessing DF.

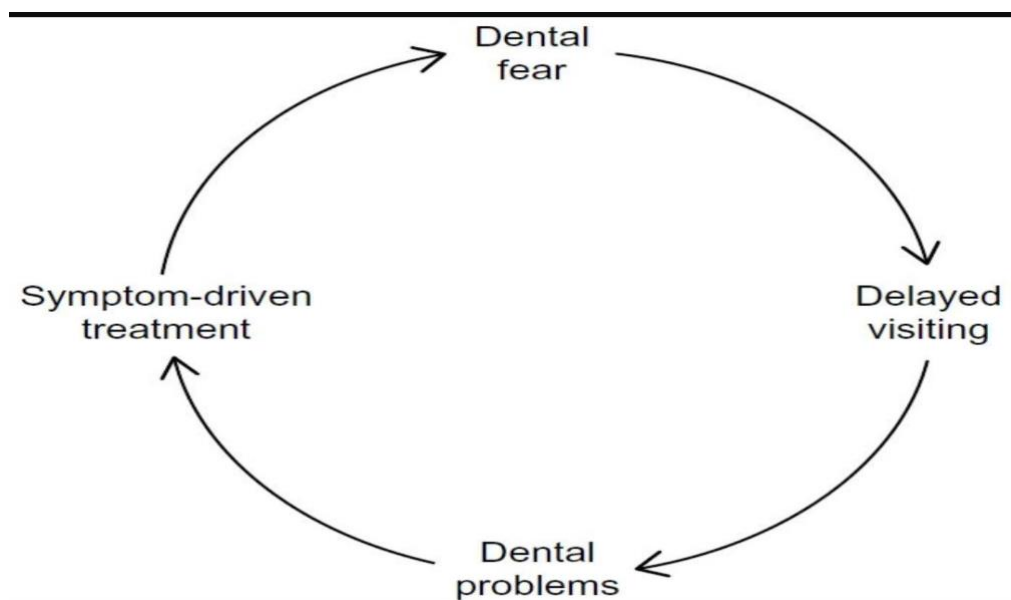


Figure 1 : cycle of dental fear(Moore, 1991)

1.1.1 Etiology of Dental Fear

- The etiology of dental fear has been discussed from various aspects, including the child's inclination for anxiety and fear, and a response to certain specific stimulus. Majority of the patients associated dental fear with past painful experiences during their childhood (**Kleinknecht and Bernstein, 1978; Milgrom et al., 1988; Klingberg et al., 1999**), and from negative staff behavior (**Milgrom et al, 1992**).

1.1.2 Classification of Dental Fear

According to (**Eli et al.,1997; Koch and Espelid, 2001**).

1_Conditioned fear of specific painful or unpleasant stimuli (drills, needles, sounds, smells etc.)

2_Anxiety about somatic reactions during treatment (allergic reactions, fainting, panic attacks, death)

3_Patients with other complicating trait anxiety or phobic symptoms

4_Distrust of dental personnel

1.1.3 Determinants of Dental Fear

1_Gender:

Few author's have found no gender differences in children's and adolescent dental fear (**Majstorovic et al.,2003; Van Meurs et al.,2005**). whereas others reported that girls were more fearful (**Ten Berge et al.,2002; Klingberg and Broberg, 2007**). **Neverlein, (1994)** reported in his study that the component of dental fear was more in adolescent girls

than in boys. **Murray et al, (1989)** reported from his longitudinal study that when self-efficacy, fear of danger and death and the number of dentists visited were checked for, the girls, reportedly had peer ratings and medical fears which can be predictors of dental anxiety and the boys with dental fear or anxiety may be more responsive to stress during treatment.

2_Psychosocial Factors:

personality traits differ in children with and without dental fear and is directly related to general fear, low self-esteem, shyness and timid nature, and pessimism and exhibiting negative emotions (**Ten Berge et al.,2002; Cinar and Murtomaa, 2007**). **Gustafson et al, (2007)** reported from his study that children from low socio-economic strata participated in less leisure activities and had worst social interactions.

3_Age of Fear Acquisition:

the prevalence of fear differs from 6% to 56% (Milgrom et al., 1988; Ten Berge et al., 2002). The other determinants for this are previous frightening experiences which could either have been painful or embarrassing and also a previous history of dental anxiety. The developmental stage of a child also plays a role on the development of fear(**Ten Berge et al., 2002; Folayan et al.,2004**), and the younger children in their pre-operative period, do not cope with the dental treatment (**Piaget, 1947; Ten Berge et al.,2002**).

1.2 Dental anxiety

Anxiety can be defined as a state of unpleasantness with an associated fear of danger from within or a learned process of one's own environment. It depends on the ability to imaging (**James et al, 2002**). Anxiety is one of the most common problems encountered in the dental

operator and is a source of challenge for the Pediatric Dentist; as many children who are extremely anxious totally avoid the dental examination and refuse the dental treatment. Dental anxiety is described as state anxiety as it occurs due to the dental treatment procedure and is related with negative expectations which are often linked to earlier traumatic experiences, negative attitudes in the family (**Cohen, 1982**). Fear of pain and trauma and perceptions of an unsuccessful and/or a painful previous dental treatment (**Taani, 2001**). The consequences of dental anxiety are delaying or avoiding a visit to the dentist, difficulties in treating such patients, increased incidence of stress when visiting the dentist, and poorer oral health. If anxiety is not diagnosed in time, a “vicious circle of dental anxiety” occurs. Dental fear and anxiety lead to the neglect of oral health, resulting in a worsening of the problem, and This leads to longer and more painful treatment that increases fear in the patient and leads to re-avoidance of the office and the entire dental team (**Armfield et al., 2007; Goh et al., 2020**). Communication between the three components of this triangle (the interdependence of each component on the attitude of the other two) is a key factor in creating the conditions appropriate for performing dental treatment (**Armfield and Heaton, 2013**). It has been discovered and generally accepted that the genesis of dental anxiety occurs in childhood and is not inherited. Reasonable speculation is that these early dental fears shape the patient’s attitude in adulthood. Research has shown that adults who have negative attitudes about going to the dentist can and do transmit such attitudes to their children (**Boynes et al, 2014**).

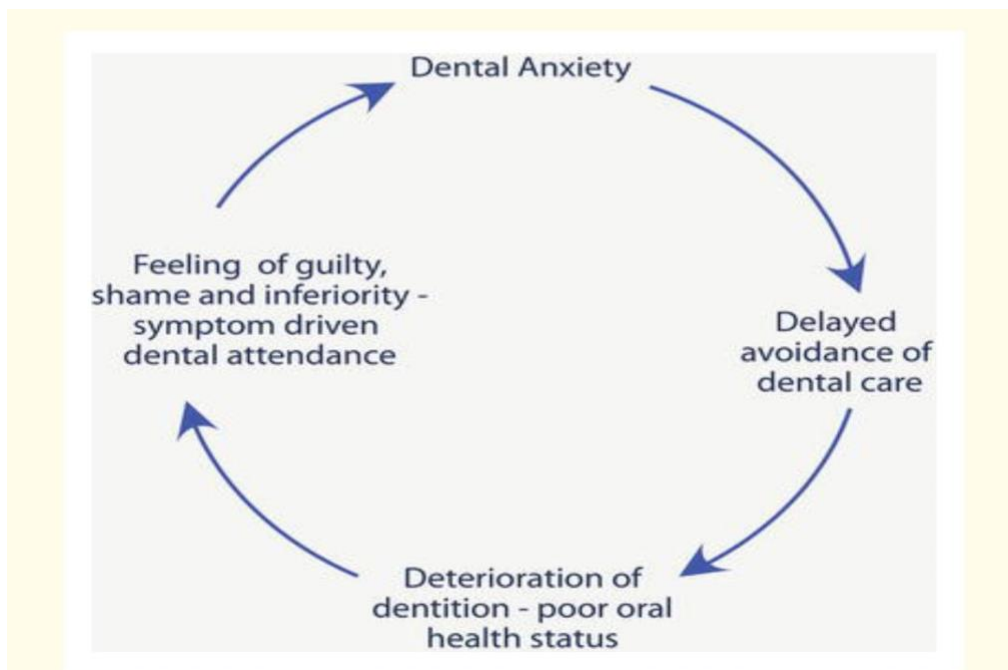


Figure 2: The cycle of dental anxiety (**Berggren and Meynert, 1984; Moore et al., 2004**).

1.2.1 Etiology of Dental anxiety

The etiology of dental anxiety is a highly debated topic and many theories are put forth. One such theory states that there are two groups of dentally anxious individuals; exogenous and endogenous. In the exogenous group, dental anxiety results from traumatic dental experiences or even vicarious learning; and in endogenous group, the individual has a constitutional vulnerability to the anxiety disorders as evidenced by general anxiety states (**Weiner and Sheehan, 1990**). The age of origin of dental anxiety is during childhood which continues to persist in later life too (**Locker et al,1999**). **Ost, 1987** a view challenged

by other authors and reported that almost 20% of dental phobics were in the age group of 14; similarly. **Milgrom et al, (1988)** reported that 33.3% of the individuals whom he studied, became anxious during adolescence and in adulthood. The nature of dental anxiety is more often related to age of onset; and it is believed that child-onset subjects are more often exogenous and the later-onset individuals are more likely to be endogenous (**Weiner and Sheehan,1990**).

1.2.2 The impact of dental anxiety

Dental anxiety can have a profound detrimental impact on the quality of life of the sufferer. One study has shown that the impact of dental anxiety on people's lives can be divided into the five categories outlined below

(Cohen et al., 2000).

- . Physiological disruption – e.g. dry mouth, increased heart rate, sweating.
- . Cognitive changes – e.g. negative and even catastrophic thoughts and feelings, unhelpful beliefs and fears.
- . Behavioral changes – e.g. alteration of diet, attention to oral hygiene, avoidance of dental environment, crying, aggression.
- . Health changes – e.g. sleep disturbance, acceptance of poor oral health.
- . Disruption of social roles – e.g. reduced social interactions and adverse effects on performance at work. Family and personal relationships can also be adversely affected .

1.3 Parental DFA

Pointed out that parental DFA influences the behavior of adolescents and, therefore, can influence the seeking of dental care. For this reason, it is extremely important to pay attention to parental DFA before their child's intervention and treatment. Comments from parents and peers about dental treatment strongly influence the fear of dental treatment (**Klingberg and Broberg, 2007; Lara et al., 2011**). Some studies have shown a close link between maternal and child dental anxiety. Maternal anxiety before the child's dental procedure was found to be significantly associated with the child's dental phobia (**Klingberg and Broberg, 2007; Lara et al., 2011; Esa et al., 2020**). However, the family environment has changed with the increasing number of single parents, mixed families, etc. Mothers do not always bring their children to the dentist—sometimes fathers, both parents or caregivers do so. This leads to the conclusion that the connection between the anxiety of parents and children should not be investigated exclusively with mothers (**Caprara et al., 2003**). **Khawja et al, (2015)** Found that parental dental anxiety directly affects a child's dental anxiety and found a significant association between maternal dental anxiety and increased child caries findings. When assessing children's behavior, it is very important to pay attention to the correct choice of method based on the psychological development of the child and the degree of dental anxiety, the correct way of conducting measurements and the correct interpretation of the results. One of the best-known measurement scales used to assess dental anxiety is the Corah Dental Anxiety Scale (CDAS or DAS). The test is very simple, has a high coefficient of reliability, and it takes about five minutes to complete. These are the main reasons for its most common application in everyday clinical practice (**Corah et al., 1978; Khawja et al., 2015**).

1.4 Identifying dentally anxious or fear patients

The initial interaction of the dentist with the patient can fairly reveal the presence of anxiety and fear, and in such situations, subjective and objective evaluations can greatly enhance the diagnosis for successful management. The table below shows the psychophysiological and behavioral responses of anxious or phobic patient.

(Table 1) Psychophysiological and Behavioral Responses (**Appukuttan, 2016**).

Psychophysiological responses	Behavioral and emotional responses
Muscle tightness Hands unsteady Restlessness Clearing the throat Sweating of the palms of hands, forehead, upper lip	Hyperactivity Walking or talking faster In a hurry Irritation with delays Panicky
the palm of the hand can be assessed during) Handshake) Pulsation in the carotid and temporal arteries Depth and speed of respiration Stiff posture Holding things tightly Strong startle response Frequent urination	Blushing Getting tongue-tangled Avoiding people Nervous habits Poor memory Confusion, stumbling over words Sitting on the edge of the chair, leaning forward Rapidly thumbing through

- Objective measures

Objective measures involve assessment of blood pressure, pulse rate, pulse oximetry, finger temperature, and galvanic skin response. An extremely accurate objective method used in various studies to measure dental anxiety is galvanic skin response. It takes advantage of the electrical changes induced by minute amounts of fluid from epidermal sweat glands released secondary to anxiety. Sweat on the skin provides a low-resistance pathway for electric current, which is then recorded. The use of galvanic skin response has been validated as an accurate method in measuring dental anxiety (**Caprara et al., 2003**).

1.5 Assessment Methods for Dental Fear and Anxiety

The assessment of dental fear and anxiety in children is possible through a number of means. The determination of the presence or severity of dental fear and anxiety in children requires more indirect methods, such as asking the child questions (cognitive approach), observing behavior during dental treatment, or recording physiological responses to anxiety, such as the pulse rate and sweating. Amongst the vast number of options, four major types of assessment tools may be grouped based on the type of informant or information gathered (**Gustafsson et al., 2010**).

1.5.1 Self-Report Assessment for Dental Fear and Anxiety

The most common dental fear and anxiety assessment measures belong to the self-report type. Children respond to questions or instructions that provide information about their dental fear and anxiety. No other parties, such as the children's parents, are involved. The simplest way is to directly ask a single question: whether the child is scared or anxious, of course. Alternatively, a visual analogue scale may assist in pointing out the severity of dental fear and anxiety. However,

more sophisticated means of dental fear and anxiety measurement have been used in research. This may be in the form of questionnaires, pictorial scales or the assessment of children's artwork in a guided situation (**Yon et al.,2020**).

The Wong-Baker face Pain Scale

Pain severity assessment, as required by The Joint Commission, is intended to improve the quality of pain management. Measures of a patient's Pain must be reliable and accurately reflect the intensity of pain being experienced. The practice of assessing pain as "the fifth vital sign" has become widespread, despite a lack of published evidence demonstrating the accuracy and effectiveness of screening strategies. Self-report of pain intensity is the preferred approach to pain assessment. There are several tools available to reliably assess pain in children; however, there is no accepted criterion standard (**American Academy of Pediatrics and American Pain Society, 2001**). The visual analog scale (VAS) is a common method for the quantification of pain severity. It is a continuous

outcome measure consisting of a 100-mm scale from 0 to 100 with low and high end points of no pain and worst pain. The VAS is easy to administer and has been validated in adults and older children. The VAS has been shown to be a reliable and valid measure of acute pain in the emergency department (ED) (**Bijur et al, 2001**). Facial expression drawings ("faces scales") are a popular method of pain severity assessment in pediatric populations. Faces scales use a series of facial expressions to illustrate a spectrum of pain intensity. Numerous face-based rating scales are available (**Chambers et al, 1999**). Faces scales are ordinal outcome measures consisting of a limited number of categorical responses ordered

in a specific pattern. Although there is debate about the optimum design of the facial expressions, the literature suggests that they are the preferred method of pain reporting by children. The Wong-Baker FACES Scale (WBS) is one of several faces scales that has been demonstrated in multiple pediatric settings for pain assessment (Keck et al, 1996).







						
	0 NO HURT	1 HURTS LITTLE BIT	2 HURTS LITTLE MORE	3 HURTS EVEN MORE	4 HURTS WHOLE LOT	5 HURTS WORST
<i>n</i>	5	15	20	36	32	12
Mean VAS, mm (95% CI)	2.6 (0-7.2)	17.6 (11.9-23.3)	37.6 (32.9-42.4)	55 (51.6-58.6)	73 (68.2-77.4)	88 (79.8-96.6)
Median VAS, mm (IQR)	0 (0-6)	16 (8-25)	37 (31-46)	57 (48-62)	74 (66-82)	95 (73-100)

Figure 3: Statistical Analysis of the WBS(Hockenberry et al, 2005).

Hockenberry et al., 2005 found The VAS was found to have an excellent correlation in older children with acute pain in the ED and had a uniformly increasing relationship with WBS. This finding has implications for Research on pain management using the WBS as an assessment tool.

Facial Image Scale (FIS)

Buchanan and Niven (2002) created an alternative scale the Facial Image Scale by using faces as an anxiety measure, made it easier for very young children to score in a dental environment. The scale consists of a series of five faces ranging from ' very unhappy ' to ' very happy ' this measure was rated by giving one for the most positive face and five for the most negative face (De Menezes Abreu et al., 2011).

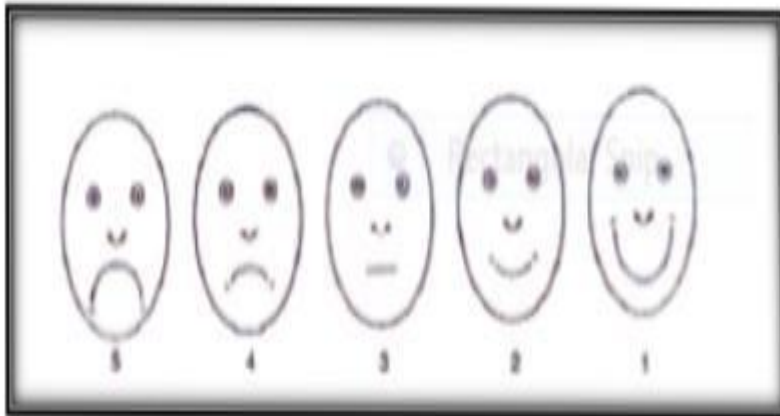


Figure 4: Facial Image Scale (FIS) (**Buchanan and Niven, 2002**).

Facial Affective Scale – three faces: 1. no anxiety; 2. some anxiety; 3. very high anxiety (Figure5) Facial affecting scale, visual scale was used to evaluate the degree of child anxiety quickly and reliably So, the MFAS- three faces was used Assessment of fear was done by using Fear assessment picture scale for girls and boys (Figure6), the scale was designed by taking a part of Klingberg's children dental fear picture test (CDFP) pointing picture and the images were drawn in frontal aspects so that the expressions can be seen. A girl or a boy cartoon in the dental chair was drawn both these pictures were paired with “not fearful”and “fearful” a facial expression. In “not fearful” cartoon the expressions were calm, and relaxed ; gave score 1 while in “fearful” there was change in expressions such as increased eye white area and facial grimace gave score 2(**OrtigosaQuiles et al, 2013**).



Figure 5: Colored Version of Modified Facial Affective Scale – three faces: 1. No Anxiety; 2. Some Anxiety; 3. Very High Anxiety.



Figure 6: Fear assessment picture scale for girls and boys

1.5.2 Observation-Based Assessment for Dental Fear and Anxiety

Parental Proxy-Based Assessment for Dental Fear and Anxiety Specific to the pediatric assessment of dental fear and anxiety is the category of parental proxy-type measures. As the name suggests, respondents are the parents of children whose dental fear and anxiety investigators intend to measure. The use of parental proxy is intended to bypass the difficulty of comprehension or the lack of cognitive ability in children (Armfield, 2010). Parents can be invited to describe their children's anxiety from their perspectives based on their past impressions and experiences (Krikken et al., 2013).

A frequently used measure is the parent version of the Dental Subscale of the Children's Fear Survey Schedule, where the wordings were changed to "How afraid is your child of [different scenarios in a dental clinic]?" When parental proxy-based assessment tools are used, the bias of using parents' perceptions of their children's dental fear and anxiety should be borne in mind and considered during analysis (Rantavuori et al., 2005). This is because the correlation between parents' responses and their children's dental fear and anxiety has been shown to vary greatly depending on the children's developmental stages (Luoto et al., 2010).

1.5.3 Physiological Assessment for Dental Fear and Anxiety

Researchers also assess dental fear and anxiety through the direct measurement of the physiological status of the child. Certain psychological stress markers known to correlate with fear or anxiety levels could reflect the level of dental fear and anxiety. Various measures, such as pulse/heart rate, nervous activity, and muscular activity, may permit real-time and continuous measurement at different phases of

treatment (**Kilinc et al.,2016; Salas Huamani et al.,2019**). Others, such as levels of psychological stress markers in saliva and serum or palmar sweating, may be detected at specific time points during dental treatment (**Mitsuhata et al.,2012**).

1.6 Management

The management of anxious/phobic patients is dependent upon the severity of the condition and the treatment that needs to be undertaken. The medical history of the patient also influences management. It is important to control anxiety in patients who have systemic disease that is aggravated or triggered by stress, for example hypertension, epilepsy or asthma. The spectrum of patient management varies from psychological or behavioral approaches to the use of pharmacological agents such as anxiolytic drugs or general anesthesia(**Longman and Ireland, 2010**). Nearly two thirds of dentists believe that treating an anxious patient present a challenge to them in everyday practice. Identifying these patients and putting appropriate measures in place is essential. Patients displaying behaviors such as frequent cancellation, delaying or rescheduling appointments may be doing so because of dental fear and anxiety (**Armfield et al., 2006**).

1.6.1 Strategies for dental fear and anxiety Management

1.6.1.1 Behavior modification

Behavior modification is based on the principles of learning, both in terms of classical conditioning or operant conditioning and of social learning. It aims to change undesirable behavior in certain situations

through learning. The strategies involve relaxation along with guided imagery and adjuvant use of physiological monitoring using biofeedback, hypnosis, acupuncture, distraction, positive reinforcement, stop-signaling, and exposure-based treatments, such as systematic desensitization, “tell-show-do”, and modeling (**Appukkuttan, 2016**). An important principle underlying cognitive behavior therapy (CBT) is its focus on the 'here and now' as what started a problem is often not the same as what is keeping it going (**Eagle and Worrel, 2007**).

In contrast to other psychotherapies, CBT is a short-term therapy, with treatment typically lasting six to ten sessions. Other characteristics of CBT which set it apart from other therapies include the collaborative nature and structured approach of CBT and asking clients to complete homework. Sessions involve assessment, collaborative goal setting, presenting and reviewing formulations (that is, working hypotheses about the client's problems), as well as receiving feedback. Homework is a key aspect of CBT, as performing tasks in between sessions enables the client to apply CBT techniques in a more natural environment and put what has been learnt in sessions into practice (**Newton et al., 2012**).

The efficacy of CBT for a range of psychological problems is now well established, most notably for depression and anxiety-related disorders (including phobias) but also for a diverse range of psychological disturbances. CBT has been reported to be 'the psychological therapy with the most solid and wide evidence base for efficacy and effectiveness' (**Kennerley et al., 2007**). Both cognitive and behavioral interventions have been shown to be successful in reducing dental anxiety and increase dental attendance (**Berggren et al., 2000; Willumsen et al., 2001**).

1.6.1.2 Relaxation therapies

Relaxation therapy is a diverse set of practices aimed at eliciting a relaxation response, including a reduction in overall physical arousal symptoms. The phobic individual implements a particular mental relaxation technique (e.g., slow breathing, counting, relaxation swallowing) to reduce stress (**carter et al., 2014**). Relaxation therapies can enhance trust and give patients the feeling of control over their psychological state. These methods can be very effective in motivated and cooperative patients, and can be used before and during a treatment appointment. These techniques are safe, have no side effects, and give patients more control over their anxiety level (**Hmud and Walsh, 2007**). A simple method for promoting relaxation is paced breathing, where patients inhale using deep diaphragmatic breathing, hold for 5 seconds, then exhale over 5 seconds. This slow paced breathing can be combined imagery-based methods with the use of particular words, visual images or thoughts that are linked with the breathing rhythm, for example using a cue word such as “CALM” on the exhalation cycle. With repeated practice, patients can move more quickly into the relaxed state. Relaxation and breathing techniques have been used successfully with patients who are fearful of receiving dental treatments, and can be easily taught to patients and applied quickly in a dental environment (**Hainsworth et al, 2005**).

1.6.1.3 Distraction

The most significant reductions in anxiety related behavior are found when the distracting material is made contingent on cooperative behavior. Children who were shown cartoons which were stopped if they became

uncooperative, showed less than half the levels of disruptive behavior in comparison to children who were shown cartoons regardless of their behavior (**Filcheck et al., 2004**). If the child is playing with a toy in the waiting room, it is possible that the toy might also serve to distract the child in the dental chair(**Efron and Sherman, 2005**).

Virtual reality techniques which involve the use of coloured glasses to experience a three-dimensional computer-generated images during dental treatment, have been shown to engage and relax adults, but less positive results for children (**Sullivan et al., 2000**).

Suitable music has been shown to influence human brain waves, leading to deep relaxation and alleviating pain and anxiety. Music distraction is a noninvasive technique in which the patient listens to pleasant music during a stressful procedure. The effect is believed to be a combination of relaxation and distraction that in turn reduces the activity of the neuroendocrine and sympathetic nervous systems. It has been successful in both pediatric and adult dental patients (**White, 2000; Moola et al., 2011**).

1.6.1.4 Computer-assisted relaxation learning

The treatment of dental fear, computer-assisted relaxation learning (CARL) is a self-paced treatment for dental phobic individuals for treating needle phobia. The program begins by introducing its purpose, followed by activities and videos on how to cope with their fear. The program is based on the theory of systematic desensitization (**Heaton et al., 2013**). As CARL is self-paced, it may perhaps aid in treating patients who wish to learn to cope without therapists, thereby improving access to oral health care (**Carter et al.,2014**).

1.6.1.5 Pharmacological management

□ Indications

Pharmacological control of pain and anxiety can be achieved by the use of sedation and general anesthesia, and should be sought only in situations where the patient is not able to respond and cooperate well with psychotherapeutic interventions, is not willing to undergo this type of treatment, or is considered dental-phobic. Patients with special needs (mental retardation, autism, mental illness, traumatic brain injury) and clinical situations can also necessitate pharmacological management.

There are a few factors to be considered prior to pharmacological management: **(Folayan et al., 2002; Newton et al., 2012)**.

1. Risks involved with pharmacological management when compared to behavioral therapies.
2. Appropriate evidence-based selection of drugs for pharmacological management.
3. Extent of the patient's dental needs and severity of anxiety.
4. Patient's cognitive and emotional needs and personality.
5. Practitioner skill, training, and experience.
6. Proper equipment and monitoring.
7. Cost of the procedure.

□ Nitrous oxide/oxygen inhalation

Nitrous oxide/oxygen inhalation is a safe and effective technique to reduce anxiety and enhance effective communication. Its onset of action is rapid, the effects easily are titrated and reversible, and recovery is rapid

and complete. Additionally, nitrous oxide/oxygen inhalation mediates a variable degree of analgesia, amnesia, and gag reflex reduction. The need to diagnose and treat, as well as the safety of the patient and practitioner, should be considered before the use of nitrous oxide/oxygen analgesia/anxiolysis. If nitrous oxide/oxygen inhalation is used in concentrations greater than 50 percent or in combination with other sedating medications (e.g., benzodiazepines, opioids), the likelihood for moderate or deep sedation increases (**Clark and Brunick, 2019**).

The objectives of nitrous oxide/oxygen inhalation include to: — reduce or eliminate anxiety; — reduce untoward movement and reaction to dental treatment; — enhance communication and patient cooperation; — raise the pain reaction threshold; — increase tolerance for longer appointments; — aid in treatment of the mentally/physically disabled or medically compromised patients; — reduce gagging; and — potentiate the effect of sedatives (**American Academy of Pediatric Dentistry, 2020**).

□ **Benzodiazepines**

Oral (enteral) sedation has become increasingly more popular in minimal and moderate sedation for the general dentist for the phobic patient. The benzodiazepines have become the drugs of choice in providing phobic or anxious patients restful sleep the night prior to the appointment, and also as anxiolytics or moderate procedural sedatives (**Weiner, 2011**). As a drug class, benzodiazepines are extremely safe, and there is a wide margin between therapeutic and toxic doses. The use of enteral sedation using benzodiazepines to provide moderate sedation either by doses larger than those recommended or in multiple or stacked dosing

techniques remains a paradigm unique to dentistry, and continues to be an evolving area, with the clinical practice moving ahead of an evidence-based scientific foundation (**Jackson et al., 2006**). The most popular oral benzodiazepines in dentistry are diazepam, triazolam, and lorazepam. These can be prescribed as sleeping aids for the anxious patient the night before surgery, as a premedicant prior to the appointment, or as a procedural sedative during the procedure (**Weiner, 2011**).

□ **Deep sedation**

Deep sedation is “a state of induced depression of the consciousness accompanied by a partial loss of protective reflexes, including the ability to continuously maintain the airways and/or respond adequately to physical stimulation and verbal commands”. The most widely used pharmacological associations are benzodiazepines and barbiturates or benzodiazepines and morphine (**Abdullah et al., 2011; Smiley and Prior, 2014**).

□ **General anesthesia**

General anesthesia is a controlled state of unconsciousness accompanied by a loss of protective reflexes, including the ability to maintain an airway independently and respond purposefully to physical stimulation or verbal command. Depending on the patient, general anesthesia can be administered in a hospital or an ambulatory setting, including the dental office. Practitioners who provide in-office general anesthesia (dentist and the anesthesia provider) should be familiar with and follow the recommendations found in the AAPD’s Use of anesthesia providers in the administration of office-based deep sedation/general anesthesia to the pediatric dental patient (**American Academy of Pediatric Dentistry, 2019**). The need to diagnose and treat, as well as the

safety of the patient, practitioner, and staff should be considered for the use of general anesthesia. Anesthetic and sedative drugs are used to help ensure the safety, health, and comfort of children undergoing procedures. Increasing evidence from research studies suggests the benefits of these agents should be considered in the context of their potential to cause harmful effects (**American Academy of Pediatrics, 2014**).

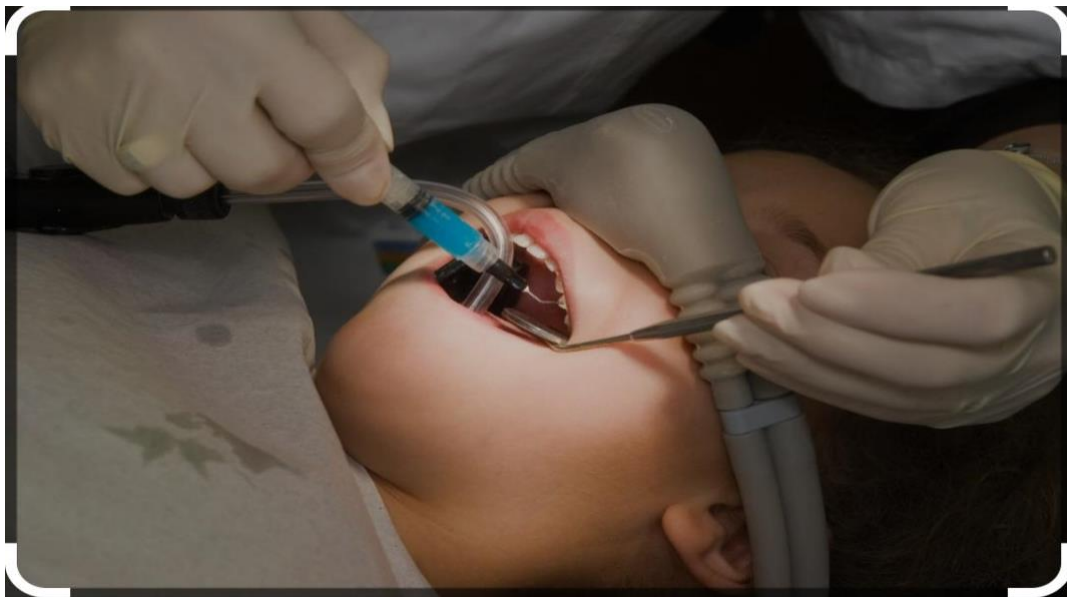


Figure 7: (Dougherty, 2009)

The goals of general anesthesia are to: — provide safe, efficient, and effective dental care; — eliminate anxiety; — eliminate untoward movement and reaction to dental treatment; — aid in treatment of the mentally- physically-, or medically-compromised patient; and — minimize the patient's pain response (**American Academy of Pediatric Dentistry, 2020**).

1.6.2 Behavior management techniques

□ Tell-show-do

The technique involves verbal explanations of procedures in phrases appropriate to the developmental level of the patient (tell); demonstrations for the patient of the visual, auditory, olfactory, and tactile aspects of the procedure in a carefully defined, nonthreatening setting (show); and then, without deviating from the explanation and demonstration, completion of the procedure(do). The tell-show-do technique operates with communication skills (verbal and nonverbal) and positive reinforcement. The objectives of tell-show-do are to teach the patient important aspects of the dental visit and familiarize the patient with the dental setting, armamentarium and shape the patient's response to procedures through desensitization and well-described expectations. It can be used with any patient (**Feigal, 2001; Townsend and Wells, 2019**).

□ Voice control

Voice control is a punishment technique involving a controlled alteration of voice volume, tone, or pace which, more specifically, equates to issuing commands in a loud voice in order to reduce a child's disruptive behavior (**Newton et al., 2012**). It is a controlled modification of the clinician's voice to influence the behavior of the child. The objective is to gain and maintain the attention of the patient, avoid negative behavior, and establish the adult – child role in the clinical setting. When using voice control, the dentist must be aware that when communicating with a child, the words being used must be used at an age - appropriate level, using terms that the child will understand and using commands that the child will understand and able to follow easily. Changing the tone of voice will keep the child's attention, the tones of the

voice will praise the positive behavior, and others will discourage the negative behavior to progress. This technique can be used at any age **(Weiner, 2011)**.

Distraction

Distraction techniques are helpful to reduce stress levels and aid coping with the LA injection process. Distraction is defined as “a state of mind that draws the attention away from painful or unpleasant stimuli”. **El-Sharkawi et al. (2010)** reported a split-mouth randomized, controlled trial which found distraction induced by audiovisual glasses was an effective way to reduce the pain associated with injection of local anaesthesia in children.

Enhancing trust and control

Building trust in the staff included communicating and cooperating with members of the dental team. Developing a sense of control, meanwhile, involved taking an active role in one's own care and communicating one's wishes to the dentist and staff. The overall theme that emerged from these interviews was that fearful individuals see receiving dental care as a mutual effort on the part of both the patient and the dental practitioner, and that both parties need to make efforts to make the treatment proceed smoothly **(Armfield and Heaton, 2013)**.

Positive reinforcement

Praising the child for being well behaved will reinforce good behavior. This technique includes not only the verbal praise by the dentist, but also from the staff and the parent. The core principle of this technique is that children and adolescents will respond better to

immediate rewards. The initial and any thereafter positive behavior should be reinforced, and once the desirable behavior has been attained and children have learned, the reinforcers should be used with measure and only occasionally in order to maintain their value (**Weiner, 2011**).

□ **Modeling**

The idea behind modelling is that one person's behavior can be altered as a result of them observing another person performing a given behavior. Modelling in other health settings has been well studied and research has demonstrated that children can also benefit from viewing other children or their parents undergoing dental treatment, without fear reactions or aversive consequences (**Farhat-McHayleh et al., 2009**). Modelling can be easily presented for viewing on televisions, computers or handheld devices or can be done live using a parent or significant other person in the child's life. Filmed modelling can be considered a particularly economical approach as it does not require extensive chairside time (**Roberts et al., 2010**).

□ **Desensitization**

Systematic desensitization is a psychological technique that can be applied to modify behaviors of anxious patients in the dental setting. It is a process that diminishes emotional responsiveness to a negative, aversive, or positive stimulus after progressive exposure to it. Patients are exposed gradually through a series of sessions to components of the dental appointment that cause them anxiety. Patients may review information regarding the dental office and environment at home with a preparation book or video or by viewing the practice website. Parents may model actions (e.g., opening mouth and touching cheek) and practice with the child at home using a dental mirror (**Nelson et al., 2015**).

© Objectives: • proceed with dental care after habituation and successful progression of exposure to the environment; • identify his fears; • develop relaxation techniques for those fears; and • be gradually exposed, with developed techniques, to situations that evoke his fears and diminish the emotional responses (**Townsend and Wells, 2019**).

1.6.3 Aromatherapy

Use of plant-derived essential oils for treatment and healing is known as aromatherapy. Although the name "aroma" suggests that the oils are breathed, they can also be applied topically or, less frequently, eaten orally. Never ingest essential oils by mouth without explicit guidance from a skilled and trained professional. Essential oils are receiving more attention as a substitute therapy for infections, stress, and other health issues, whether they are breathed or used topically (**Chader et al., 2016**).

1.7 Iraqi studies related to dental fear and anxiety

Ibrahim and Muslim, (2018) reported in their study that patient satisfaction is inversely related to dental anxiety, and some aspects of Patient satisfaction such as (satisfaction with the general appearance of the clinic, satisfaction with the reception, satisfaction with patient information provided, and satisfaction with safety procedures and services) have predicted with dental anxiety. Furthermore, the results showed That there were significant correlations between dental anxiety and patient satisfaction on one hand and the demographic variables such as (age, number of visits and cultural level) on the other hand, the age of patient is inversely related to dental anxiety whereas the number of visits has reversely a connection with patient anxiety, which means that both of them have predicted with dental anxiety. These findings agree with most

of the previous studies, such as the study of (Marshall and vetal, 1994;Reifel etal, 1997; Prakash and Bhanu, 2010; Salem and Muslim, 2015). As for patient satisfaction, the literatures indicated that there are multiple aspects of patient satisfaction. There is an inverse significant correlation between patient satisfaction and dental anxiety. There are two demographics variables have predicted with dental anxiety which are age and number of visits to dental clinic. While there are four aspects of patient satisfaction are predicted to dental anxiety, which are satisfaction of (appearance of the clinic, the reception, patient information, and services with safety).

Rasha Khalaf, (2020) concluded fear was the most common cause of avoiding dental visits in children. Children preferred multicolor and bright colors for dental use with significant differences between genders. Adding attractive colors to the dental environment and the incorporation of colors in the dental instruments, equipments, and restorative materials can enhance positive emotions and help reduce dental anxiety.

Noor A. Kadhim, (2018) reported that Statistically non-significant differences were showed in anxiety, fear, pulse rate and oxygen saturation among children with and without presences of their parents in dental clinic regarding three interval of measure(before, during and after pulpatomy treatment). Non-significant differences found in fear, pulse rate and oxygen saturationamong three intervals of measure within inter group (children with and withoutpresence of parents during Dental treatment)while significant differences in anxiety found between two intervals(during and after dental treatment)through using Friedman test

within intergroup of children with presences of parent while did not reach to significant value among children with absences of their parents at three interval of measure.

Marwa Mohammed Ali, (2022) concluded that due to aromatherapy pharmacological effects, which can modify and influence emotions, aromatherapy has the ability to improve the emotional state of pediatric dentistry patients. Before beginning dental treatment, it helps to lessen dental anxiety. It is safe and can be used as an adjunct therapy, but it cannot be utilized in place of the standard form of treatment.

Chapter two: conclusion

Conclusion

Dental fear and anxiety can have adverse impacts on a person's quality of life, and hence it is imperative to identify and alleviate these significant obstacles to pave the way for better oral health and overall well-being of the individual. It is the duty and responsibility of the dentist to provide excellent dental care to these patients with special needs as well. Management of these patients should be an integral part of clinical practice, as a substantial proportion of the population suffers from anxiety and fear. Therapy should be customized to each individual following proper evaluation, and should be based on the dentist's experience, expertise, degree of anxiety, patient intellect, age, cooperation, and clinical situation.

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