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Research Paper

Dental anxiety: Causes, Complications and Management: A review

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Abstract: *Anxiety related to the dental environment and to specific dental treatments is a problem suffered by many patients worldwide, and it remains a significant challenge in providing dental care.1 Anxiety is an emotional state that helps normal individuals defend themselves against a variety of threats; however, anxiety disorders are a dysregulation of these normal defensive mechanisms, with either excessive or deficient responses.2*
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I. INTRODUCTION

Dental anxiety has been ranked fifth among commonly feared situations.3 Due to its high prevalence; patients with dental anxiety avoid dental visits.4

II. CAUSES

No one single variable can account exclusively for its development as it is a multidimensional complex phenomenon.
Factors that have consistently been linked with a greater incidence of dental anxiety include:
• Personality characteristics,
• Fear of pain,
•Past traumatic dental experiences, particularly in childhood (conditioning experiences),
• The influence of dentally anxious family members or peers which elicit fear in a person (vicarious learning), and
• Blood-injury fears.5, 6-11

Several studies have shown that restorative dentistry procedures deliver the most potent triggers for dental anxiety, namely the sight, sound and vibrational sensation of rotary dental drills 6, 12, 13 coupled with the sight and sensation of a dental local anaesthetic injection.6, 13, 14

It is for this reason that anxious patients who must undergo restorative procedures are often managed using the "4 S" rule, which aims to reduce the triggers of stress,
• Sights (e.g. needles, drills)
• Sounds (drilling)
• Sensations (high frequency vibrations – with a high annoyance factor)
• Smells (clinical odors such as eugenol and bonding agents)

Aspects of dentist-patient interactions are particularly important here. Triggers for dental anxiety can also include statements made by the operator.12 The period of time spent waiting for dental treatment is cited

commonly by patients as being anxiety-provoking, as it increases the time to think about what will (or could) happen, and to ponder the worst-case outcomes.15

CONSEQUENCES AND COMPLICATIONS

Dental anxiety has been associated strongly with poor oral health status.15 Even if anxious dental patients attend regular dental visits, they are likely to avoid necessary follow up appointments to complete the required dental treatment.12 Avoidance of dental treatment results in higher caries prevalence 15, 12, 16, leading to a greater need for oral rehabilitation.12

Dental anxiety evokes physiological responses of the "fright or fight" type, and these can lead to feelings of exhaustion after a dental appointment.

As would be expected, a patient's attitude toward dentists has been shown to have an inverse linear relationship with dental anxiety, that is, more anxious patients were less positive about their dentist.13 Moreover, as patients' perceptions of dentists' competence decreased, their dental anxiety was found to increase.17

III. MANAGEMENT

Nearly two thirds of dentists believe that treating an anxious patient presents a challenge to them in everyday practice.18 Identifying these patients and putting appropriate measures in place is therefore essential.
Upon identification of an anxious or fearful patient, a range of measures can be put into place, for example:

• Allowing sufficient time for the dental appointment
• Minimizing triggers, following the "4 S" principle described earlier, e.g. by altering the surgery set-up, the dental assistant can place instruments where they are blocked from view or covered 35, or could spray a scented oil fragrance to reduce the clinical aroma of the treatment room,
• Introducing relaxation methods,
• Provision of extra control during the procedure,
• Using distraction techniques, e.g. music via headphones, video glasses, and virtual reality glasses (especially for adults),
• Providing more efficient anesthesia, or using adjunctive methods, e.g. peristaltic injectors (Wand ™), topical creams (EMLA ™), and transcutaneous nerve stimulation
• Referral to cognitive or behavioral specialists or psychologists for anxiety management and behavior therapy 19
• Conscious sedation using pharmacological agents

A) Communication

Staff-patient communication plays a very important role in anxiety reduction. Providing verbal support and reassurance is a frequently used strategy.20

B) Psychotherapeutic management

Behavior-management techniques

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.21

C) Relaxation therapies

Relaxation therapies can enhance trust and give patients the feeling of control over their psychological state. A common method is Jacobsen's progressive muscular relaxation, which relaxes patients by reducing physical (muscle) tension, and makes them more aware of their stressed and aroused state, and how to address this. Their greater feeling of control over the situation and over their anxiety symptoms should translate into greater ability in coping with the stress of dental treatment. A simple scheme for progressive muscular relaxation involves tensing and relaxing groups of muscles in turn, for example from the feet through the lower body and abdomen to the thorax and then the head and neck.

Another simple method for promoting relaxation is paced breathing, where patients inhale using deep diaphragmatic breathing, hold for 5 seconds, then exhale over 5 seconds.
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.22

1. Guided imagery

Guided imagery has been defined as a directed, deliberate daydream that uses all the senses to create a focused state of relaxation and a sense of physical and emotional well-being. It is a mind–body exercise, wherein patients are taught to develop a mental image of a pleasant, tranquil experience that consciously guides their attention to achieve relaxation, thereby reducing anxiety. There are generally three stages to guided imagery: relaxation, visualization, and positive suggestion.23

It is relatively easy to learn, teach, and use in practice. It can be performed by an adequately trained dentist or with the use of audio recordings, and can be performed daily or as needed by the patient.

2. Biofeedback

Biofeedback is also referred to as applied psycho-physiological feedback, and is a mind–body technique. Biofeedback therapies use instruments to measure, amplify, and feedback physiological information to the patient being monitored. The information assists the patient in gaining self-regulation of the physiological process being monitored. Monitoring oneself and then utilizing the information to practice and achieve self-regulation are the main goals of biofeedback. 21

3. Acupuncture

Acupuncture is a technique wherein the disease is treated by inserting needles at various points on the body, known as acupuncture points. It has been reported that acupuncture is effective in treating dental problems such as anxiety, temporomandibular dysfunction syndrome, pain, and Sjögren's syndrome. It is a simple, inexpensive treatment modality that requires special training before it can be incorporated into practice. Reports on the use of auricular acupuncture for treating chronic and acute anxiety have shown promising results.24, 25

4. Enhancing control

Loss of control over the treatment procedure is a significant cause for anxiety, and hence providing control is very essential. Telling the patient what to expect, and what measures are taken to ensure their safety, will help make the treatment as comfortable as possible. Control can be provided by giving information and through behavioral control. Informational control can be achieved by the "tell-show-do" and modeling techniques.

Behavioral control involves giving the patient a chance to feel that they are in control of the treatment procedure. It involves signaling to the dentist or dental hygienist to stop the procedure; this increases the patients' sense of control and trust in the dentist. 21

5. Positive reinforcement

Positive reinforcement is an effective technique to reward desired behaviors and thus strengthens the recurrence of those behaviors. Reinforcers include positive voice modulation, facial expression, verbal praise, and appropriate physical demonstrations of affection by all members of the dental team. These should be individualized, frequently provided, and varied over time. 26

6. Cognitive therapy

The thoughts and emotions of a person are not separate; rather, they overlap each other and behavior depends on their thoughts. Thoughts and expectations trigger different feelings and physiological reactions. Anxious patients most often have inappropriate expectations and beliefs about dental treatment. The modification of such negative cognitions is a means of reducing anxiety. Cognitive treatment strategies aim to alter and restructure the content of negative cognitions and enhance control over the negative thoughts.

Cognitive Behavioral Therapy is a combination of behavior therapy and cognitive therapy. It is today the most accepted psychological treatment for anxiety related to particular situations and specific phobias. It involves learning to change negatively distorted thoughts (cognitions) and actions (behaviors). CBT treatment generally contains psychoeducation, graded exposure, cognitive restructuring, behavioral experiments, and relaxation, as well as self-assertiveness training. Dentists need special training to integrate this therapy in practice. 27, 28

D) Hypnosis — This is effective for some, but requires a controlled, quiet environment; skill; inter-patient/ practitioner trust; time; and conditioning. Sometimes, an outside hypnotherapist can come to your office. This is not for everyone. Hypnotherapy can be enhanced in combination with nitrous oxide/oxygen, or conscious sedation. 1

E) Distraction

Virtual reality techniques which involve the use of colored glasses to experience three-dimensional computer-generated images during dental treatment have been shown to engage and relax adults. 1

F) Techniques with reduced annoyance factors

The term "annoyance factor" refers to the patient's subjective reaction to restorative dentistry procedures such as cavity preparation, and is a combination of the pressure applied to the tooth, the vibrations and noise recorded through the bones of the skull, the heat and smell generated at the interface between the tooth and the bur and the time taken to perform a given task. 29

Using alternative methods such as

• Atraumatic restorative technique (ART): The ART method has been used extensively in dentistry for conservative management of open cavity formation in dentine.

• Chemo-mechanical caries removal (Carisolv) is a minimally invasive method which involves the selective removal of soft carious dentine without the painful removal of sound dentine during cavity preparation, as a form of chemically accelerated ART.

• Air abrasion

• Pulsed Er:YAG and Er,Cr:YSGG lasers act selectively on water present in hard tissues, because of their wavelengths and are able to ablate carious enamel and dentine. When used properly they may induce a depressed state of responsiveness in pulpal nociceptors 29.

• Ultra-low speed cutting

• Polymer bur cutting

• Ultrasonic instruments with diamond-coated tips help to eliminate or reduce a major trigger of dental anxiety.

G) Pharmacological management

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.30, 31

There are a few factors to be considered prior to pharmacological management:

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. 21

- ***Sedation***

Conscious sedation techniques have been proven to be reliable and safe for managing dental anxiety, 32 while more severely anxious and uncooperative patients can be treated under general anaesthesia. Agents such as nitrous oxide and oxygen administered by inhalation are in common use, however for anxiolytic agents, a wide range of routes of administration exist, including ingestion, rectal suppository, intramuscular injection, and intravenous injection for direct application into the circulation, as in the case of midazolam, diazepam and other benzodiazepines.33

Agents used for sedation must produce a relaxed state rapidly for the period needed, but must then wear off rapidly so that the patient can return to their normal state.33

A thorough medical, dental, and social history must be taken and recorded to ensure that the conscious sedation technique chosen is the most appropriate to enable successful treatment outcomes for each individual, taking into account such factors as the patient's age, state of health, social circumstances, and any special needs they may have. Sedation should not be used habitually when there is no specific indication.34, 35

IV. CONCLUSION

Dental anxiety and phobia 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, and degree of anxiety, patient intellect, age, cooperation, and clinical situation.

The management of the dentally anxious patients should involve considering both complementary and pharmacological means. Helping highly anxious patients to overcome their fear of dental treatment is a challenge, however if achieved it will result in improvement in their oral health and in their overall quality of life and wellbeing.

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