



Management of Dental Anxiety, Nurse Intervention, and Support for Sedation: A Comprehensive Review

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Abstract

Dental anxiety is a frequent disorder in the population, contributing to avoidance of treatment and adverse oral health outcomes. This evidence-based systematic review of interventions for dental anxiety places at its core nursing intervention and sedation support, based on 50 peer-reviewed publications. The review spotlights non-pharmacologic interventions, including behavioral interventions like Tell-Show-Do, distraction, and relaxation, and Cognitive Behavioral Therapy (CBT), effective in attaining reduced phobia and anxiety. Environmental adaptation like aroma therapy and sensory minimization contribute to patient comfort. Pharmacologic interventions like general anesthesia and conscious sedation (e.g., nitrous oxide) are used for more severe conditions, and the role of the dental nurses in providing safety measures by vital sign monitoring and reassuring calm of patients is emphasized. The review also spotlights the key role of the dental nurses in assessment of the patient's anxiety, in the administration of interventions, and sedation support, the emphasis being on the empathic communication style and CBT and sedation training. Liminality yet remains in the pediatric interventions field and technology application like virtual reality. Standardization of the nursing training and cultural issues treating would be warranted to make the care more available. This review points to the interdisciplinary management of dental phobia/anxiety with psychotherapeutic and drug therapy to ensure the best patient outcomes and the alleviation of the phobia/anxiety in the field of dentistry.

Keywords: Dental anxiety, nursing interventions, sedation support, Cognitive Behavioral Therapy, behavioral techniques.

Introduction

Dental phobia is also prevalent, and the estimated incidence has been established to range from 20% to 80% in general adult patients in general dental practice practice (Appukuttan, 2016). It manifests in the form of phobia, stress, or fear of visiting the dentist, causing avoidance of therapy, therefore the acceleration of the oral conditions (Armfield, 2013). The reason for the phobia of teeth ranges from previous traumatic experience, the sound of the drill, or the anticipation of pain (Appukuttan, 2016). The response can result in the autonomic response of the body, where the body's blood pressure and heartbeat increase, rendering the procedure more difficult (Karan, 2019).

Dental nurses are key players in the management of dental anxiety by the use of empathetic communication, behavioral interventions, and sedation support. Nurse interventions from the establishment of the relaxing office environment to the application of cognitive-behavioral interventions remain essential in the management of mild to moderate anxiety. In the management of severe conditions or dental phobia, the application of pharmacologic interventions including conscious sedation or general anesthesia might be considered (Appukuttan, 2016). The present review explores the relationship between the management of dental anxiety, nursing interventions, and sedation support by the presentation of in-depth evidence-based approaches to the management of patients.

1. Methodology

This systematic search of the databases, including PubMed, Embase, Web of Science, Cochrane Library, Scopus, APA PsycInfo, CINAHL, and AMED, found peer-reviewed articles on the following appropriate studies to August 2024. The terms used were the following: "dental anxiety," "dental phobia," "nursing

interventions," "sedation support," "cognitive behaviour therapy," and "behavioural management." The inclusion criteria were randomized controlled trials (RCTs), systematic reviews, and meta-analyses regarding the management of children's' and/or adult's dental anxiety. 50 peer-reviewed articles were found to provide a sound evidence base. The systematic search uses the APA 7th edition in-text citations and referencing system.

2. Dental Anxiety

Dental anxiety refers to the subjective feeling in anticipation of the experience of fear prior to undergoing treatment for one's teeth, in contrast to the more severe and diagnostic dental phobia (Humphris et al., 1995). An estimated one in seven individuals experience excessive dental anxiety, where quality of life and access to dental services were compromised (Armfield, 2013). The Modified Dental Anxiety Scale has been the most utilized questionnaire in measuring the severity of the subjective experience of the feel of anxiety, where patients were scaled as possessing extremely poor, poor, moderate, high, and phobic type of anxiety (Appukuttan, 2016), respectively. Al-Namankany et al. (2023) surveyed 500 participants in one study, where the mean MDAS score was 15 (SD = 3.5), indicating moderate subjective experience of anxiety.

Triggers for teeth anxiety also involve stimuli from the sense system like the appearance of needles, the sound of the drill, and the feeling of vibration (Appukuttan, 2016). Negative previous experiences and situational circumstances, like the uncomfortable dentist office, heighten the severity of the feeling of being anxious further (Facco et al., 2017). Physiological measures including increased pulse rate, high blood pressure, and galvanic skin reaction help in the diagnosis and severity classification of the feeling

of being anxious (Appukuttan, 2016). Detection of these triggers and the way they happen physiologically permits individualizing effective interventions.

3. Strategies for Clinically Managing Dental Anxiety

Table 1 summarizes key interventions for managing dental anxiety to include description, target population, evidence of effectiveness, and citation when available; so that readers have a clear way to compare non-pharmacological and pharmacological methods.

Intervention	Description	Target Population	Effectiveness Evidence	Ref.
Tell-Show-Do (TSD)	Explaining procedures, demonstrating tools, and performing them to familiarize patients with the process.	Children and adults with mild to moderate anxiety.	Improved cooperation in 78% of pediatric patients (MDA Score reduction).	AAPD (2020); Almarzouq et al. (2024)
Distraction Techniques	Using visual, auditory, or kinesthetic	Primarily children	Reduced self-reported anxiety	Almarzouq et al. (2024)

	stimuli (e.g., music, videos, toys) to divert attention from anxiety triggers.	for adults.	y and pulse rates by 10 bpm in children.	
Positive Reinforcement	Providing praise or rewards to encourage cooperative behavior.	Children ; applicable to adults.	Increased treatment adherence in pediatric patients.	AAPD (2020)
Systematic Desensitization	Gradual exposure to anxiety-provoking stimuli to reduce fear over time.	Adults with moderate anxiety.	65% of participants showed reduced fear after 6 weeks.	Bernson et al. (2013)
Relaxation Techniques	Progressive muscle relaxation or guided imagery to	Children and adults.	30% reduction in procedural anxiety during	Schaffner & Yucha (2004)

	manage physiolo gical response s.		scalin g.	
Cogniti ve Behavio ral Therap y (CBT)	Restruct uring negative thoughts combine d with behavior al techniqu es to address anxiety and phobia.	Adults and adolesce nts with moderat e to severe anxiety/ phobia.	70% of patien ts under went treatm ent with local anesth esia post- CBT.	Kvale (2004) ; Wide Boma n (2013) ; Kani (2015)
Environ mental Modific ations	Adjustin g sensory triggers (e.g., drill sounds, lighting) and using aromath erapy (e.g., orange, lavender)	All patients, especiall y those sensitive to sensory stimuli.	Reduc ed blood pressu re (8 mmH g) and respir atory rates with orang e fragra nce; 15% reduct ion in anxiet y with	Hashe minia et al. (2014) ; Karan (2019)

				lavender.	
Conscious Sedation	Use of nitrous oxide, oral, or intravenous sedatives to relax patients while maintaining responsiveness.	Patients with severe anxiety or special needs (ASA I or II).	85% reduction in anxiety with nitrous oxide in moderate to high MDA scores.	Milgram et al. (2010); Appukuttan (2016)	
General Anesthesia	Complete sedation for complex procedures or severe phobia.	Patients with severe phobia or urgent treatment needs.	Effective for treatment but no long-term anxiety reduction.	Bernson et al. (2013); Lee et al. (2013)	

3.1. Behavioral Intervention

Behavioral interventions are foundation approaches to the management of dental anxiety, where the goal is to alter maladaptive behaviors via systematic learning mechanisms. Behavioral interventions utilize the principles of classical and operant conditioning to introduce patients to feeling more at ease during the provision of dental treatment. By confronting the stimuli for the antagosntic

emotions directly, behavioral interventions instill feelings of familiarity and control, essential in pediatric as well as adult patients.

Tell-Show-Do (TSD) is one of the most used behavioral techniques, systematically exposing patients to the procedure of dentistry to lessen the fear. The sequence is initiated by the dental expert elaborating the procedure in easy, child-related language (the "tell" part), contributing to the demonstration of the tools or procedure being carried out by either non-threatening means, for instance, by exhibiting the dental mirror or letting the patient handle equipment (the "show" part). The procedure is then carried out (the "do" part) in the presence of management. The American Academy of Pediatric Dentistry stated in 2020 that TSD was exceptionally effective in the alleviation of anxiety by exposing patients to the environment and procedure of the dentist's office. Almarzouq et al. in 2024 carried out one study revealing that the pediatric patients who were administered the Tell-Show-Do procedure revealed marked enhancement in the aspect of cooperation in comparison to the group where no procedure was administered, in turn lowering the MDAS scores in 78% children by indicating the least amount of tension.

Distraction interventions also occur as the effective behavioral method, specifically by diverting patients' attention from stimuli leading to the experience of the sensation of anxiety during the procedure at the dentist's office. The modes of visual, auditory, or kinesthetic use occur, i.e., listening to music, viewing videos, or the use of tactile objects like stress balls or toys. By the involvement of other activities of the sense organs, distraction decreases the cognitive processing of the feared procedure part at the dentist's office, e.g., the drill sound or shots' sensation. Almarzouq et al. (2024) concluded that distraction

interventions were more effective than the usage application of the use of TSD in children undergoing invasive interventions, in terms of yielding lower scores of self-reported anxiety and lower heartbeat by 10 beats per minute less than the baseline, respectively.

Positive reinforcement is one of the behavioral methods to heighten the confidence of the patient by rewarding him/her for good behavior. The technique involves the application of verbal praise, small rewards (e.g., stickers, children's toys), or acknowledgement of the patient's effort in the therapy process. The technique has high effectiveness in pediatric dentistry because it makes the patients equate the visits to the dentist with happy sessions. The AAPD (2020) presents its application in the creation of long-term trust in the world of dentistry, further stating the fact that children who experience constant positive reinforcement more easily return for subsequent visits.

Systematic desensitization, being one of the exposure therapies, gradually exposes the patients to the stimuli creating the sense of anxiety in the non-anxiety-inducing environment to lessen the amount of fear over time. The therapy is started from the lowest-anxiety stimulus, i.e., sitting in the dentist's chair, to the high-anxiety stimulus, i.e., the drill being used. Through repeated exposure to the stimulus in the non-anxiety-inducing environment, systematic desensitization assists in desensitizing the patient to the phobia. Bernson et al. (2013) found the technique to be very efficient for moderate-dental-anxiety patients, where 65% of the subjects were found to have lower fearful behaviors once the desensitization procedure of the six weeks had been implemented.

Relaxation exercises, including progressive tension of muscles and imagery in guided leading, reduce the patient's physiologic expression of body-

generated anxiety, either the increase in heartbeat acceleration or muscle tension. The exercises familiarise the patients to indulge in relaxation voluntarily either by relaxation physically or by visualization of relaxation areas to counter stress effectively during the procedure. Schaffer and Yucha (2004) administered procedural scaling in the teeth to result in 30% less patient-anxiety perceived by the application of relaxation breathing to reduce procedural anxiety. The exercises are usually administered by the nurses from the dental unit, who introduce the patients to exercises in breathing or in imagery scripts during and before the procedure.

3.2. Cognitive Intervention

The cognitive interventions consist of altering adversely focused cognitive modes in an effort to attend to patients' management of the experience of anxiety. By challenging non-adaptive thoughts, for instance, catastrophizing about one's teeth pain or failing, the interventions permit the patients to visit the dentist's office more in confidence. The cognitive behavioral therapy, CBT, is the best cognitive intervention and by general agreement the 'gold standard' for the therapy of dental phobia and anxiety (NHS England, 2023).

CBT combines cognitive restructuring with behavioral interventions to handle the interplay between emotion, behavior, and thoughts. For example, one patient who would assume all the operations in the dental clinic were painful would be asked to challenge the assumption by evaluating evidence from the prior experiences or by being educated on the latest pain management techniques. Kvale in 2004 and Wide Boman in 2013 established the success of CBT in the treatment of dental phobia, with 70% of the patients in those studies being prepared to receive the treatment under local

anesthesia after the CBT programme. It is of great importance to patients with elevated anxiety, as it reduces the dependence on the invasive pharmacological management.

Dental nurses/CBT-trained psychologist might be administered, although post-registration specialist training in the speciality must be achieved by the dentists (NHS England, 2023). Training enables nurses to spot cognitive distortions, hence enabling them to administer specific coping techniques and exposure exercises to individual patients. In practice, Kani (2015) established in one study CBT in clinical practice in dentistry decreased MDAS scores by 5 points mean value from high to moderate states of anxious states for 60% in the population. For the patients who are extremely phobic for the teeth/or extremely anxious patients, CBT is administered alongside conscious sedation to accompany the administration of treatment administration as the underlying phobia is established and overcome, hence decreasing the application of general anaesthesia application (Porritt, 2016).

The clinical practice of CBT has been established by its flexibility to the situational needs of the various patients in different circumstances. Such brief CBT applications as single-session exposure therapy have been promising in the time-constrained patient situation or in the time-oppressive patient situation. By the implementation of cognitive restructuring and behavioral interventions such as systematic desensitization, CBT brings about the final solution for the treatment of long-term anxiety.

3.3. Environmental Interventions

The clinical office environment has been established to play the central role in the patient's emotional experience, where sensation and

interpersonal dimensions play important functions in the intensity of nervousness in patients. Receptionists and dental nurses hold the central position in preparing the non-threatening and calming environment by delivering empathetic communication, calm presence, and proper environmental interventions (Appukuttan, 2016). The warm reception, explanation of the procedure, and pleasant atmosphere of the office lower initial nervousness in patients, particularly the first timers.

Environmental interventions target sensory stimuli that increase anxiety, for example, the sound of the drill utilized by the dentist or the clinical appearance of the operating room. Techniques utilizing the application of atraumatic restorative techniques, for instance, reducing invasive interventions, or the buffering of drill sound by playing ambient music, have been proven to significantly reduce patient stress (Facco et al., 2017). Environmental interventions have also been proven to involve the application of aromatherapy. Hasheminia et al. (2014) found that ambient orange smell during surgery decreased the mean blood pressure by 8 mmHg and the breathing rates by 5 breaths per minute, indicating a measurable drop in the body's stress response.

Also, the inhalation of the oil of lavender has been found to have considerable promise in postoperative relief from anxiety. In one randomized controlled trial, Karan (2019) described patients undergoing lavender aromatherapy as having 15% lower systolic blood pressure and 20% lower self-rating scores for the rating of the severity of their anxiety than patients in the comparison group. These observations allude to the worth of implementing sensory interventions within the practice environment. Other measures of the environment, including the use of warm lights, recliner chairs, and pleasant-looking pieces of

furniture, accompany the holistic management of the anxious patient in promoting the patient-centered experience of the practice.

4. Dental Anxiety Administration with Sedation Support

When patients have profound deep phobia for teeth, extreme dental anxiety, or special needs, non-pharmacological interventions would be insufficient, and pharmacological interventions in the form of conscious sedation or general anesthesia would be inevitable. The contribution of the dental nurses to the procedure management, patient safety, and emotional support during the procedure is essential (Appukuttan, 2016).

4.1. Conscious Sedation

The patient for conscious sedation is administered medication to reduce the central nervous system but where verbal communication and protective reflexes remain present, enabling the patient to be reactive but calm during therapy (NHS England, 2023). Some agents used include nitrous oxide (relative analgesia), oral sedatives (e.g., midazolam), and intravenous sedation. The American Society of Anesthesiologists recommends the ASA grading of the risk of patients for the procedure of conscious sedation to be ASA I (healthy) or ASA II (mild systemic disease), to reduce the risk (Appukuttan, 2016).

The first-line medication for decades has been nitrous oxide because of its quick action, lack of side effects, and simplicity in administration. Milgrom's 2010 paper had reported nitrous oxide to lower the anxiety in 85% of patients whose MDAS scores were moderate to high, these effects being measurable within 5 minutes of its use. Sedation because of the intravenous route, even for longer and more

complicated procedures, has the drawback of nausea, depression of the respiratory system, and prolonged recovery time, and hence needs careful patient selection and vigilance (Appukuttan, 2016).

4.2. Effectiveness of Interventions

A meta-analysis of Prado et al. (2019) uncovered the marked reduction in the intervention group's anxiety levels compared to the controls (SMD = -0.62, 95% CI -0.98 to -0.27). For the general adult population, sedatives and audiovisual distractions were the most effective interventions ($Z = 2.44$, $P = 0.01$ for sedatives; $Z = 3.1$, $P = 0.002$ for distractions). For children, the evidence was more tenuous, and specific pediatric interventions were warranted (Prado et al., 2019). Non-pharmacological interventions such as distraction and TSD were found to invariably reduce the patient's state of anxiety and promote the following from children during medical interventions (Almarzouq et al., 2024).

CBT has been proven to be extremely effective, and Ost's (2013) and Kvale's (2004) works established long-term symptom reductions for dental phobia. Environmental interventions, e.g., the application of aromatherapy, have been found to quantitatively lessen the physiologic measures of anxiety (Hasheminia et al., 2014; Karan, 2019). The application of combined non-pharmacological and pharmacological interventions, e.g., CBT and nitrous oxide, can produce the desirable results for those patients with moderate to severe levels of anxiety (NHS England, 2023).

5. The Role of the Dental Nurse

Dental nurses also contribute to the effective management of dental anxiety by employing the unique position they occupy in patient-facing interaction and support activities to create a harmless

and relaxing experience. Their diverse scope of responsibilities in assessment, communication, the implementation of interventions, the provision of sedation support, and ongoing professional development eminently serves to create effective management of anxiety in the context of the dental practice. By fostering trust and the implementation of evidence-based interventions, dental nurses engender patient relaxation, maximize treatment compliance, and support general success in the practice of providing dental care.

Assessment is one of the nurses' important functions, including the measurement of patients' level of anxiety to ensure the adoption of the correct interventions. Through the established scales like the Modified Dental Anxiety Scale (MDAS), the nurses assess the severity of the patient's phobia in subjective manner by describing it as phobic, high, moderate, or low (Appukuttan, 2016). The nurses also assess the objective indicators of the body's functions like the pulse rate, the blood pressure, and the respiration rate to validate subjective accounts and for the purpose of planning the treatment. Through the twofold process, the patient's emotional as well as body states receive the full comprehension, allowing the nurses to advise interventions suitable for the patient's needs and the clinical conditions.

Another requirement is communication, to the extent that the nurses would initially be the first to come in contact with patients visiting the office. Through the application of empathetic, unhurry, and clear communication, the nurses shall instill confidence and minimize patient nervous tension, primarily for patients who have high nervous tensions. According to Bernson et al. (2013), by being calm and reassuring in personality, the patient's terrors diminish to a large degree, enabling patients to consent more willingly to treatment. For one to achieve this, for

example, by explaining the procedure in the most simplified terms or by discussing patient concerns in non-confrontative terms, one shall manage to flip around what would be the stressful visit, instilling the feeling of security and reassurance.

The dental nurses also participate in the application of interventions to reduce anxiety, in most cases in conjunction with the dentists. The nurses implement behavioral interventions such as Tell-Show-Do (TSD), distraction, and relaxation techniques, used primarily in pediatric patients and adult patients with mild to moderate levels of anxiety. For pediatric patients, for instance, nurses would manage children's exposure to the application of TSD by hasshewing them the instruments in the non-intimidating way or distract them by playing some music or providing toys to divert the attention from the stimuli for obtaining anxiety ((AAPD, 2020). These interventions, evidence-based in practice, empower nurses to contribute to the patient's alleviated anxiety during procedure.

In the situation where pharmacological interventions come in, sedation support by the nurses is central to the patient's safety and clinical protocol adherence. For the purposes of conscious sedation, the nurses spell out equipment preparation, vital observations of signs (e.g., blood pressure and pulse oximetry), and emotional support for the patient during the induction and the recovery stages (NHS England, 2023). Their sedation support role also applies to general anesthesia, where patient preparation before the procedure and post-anesthesia patient watching by nurses occur in the interest of strict adherence to safety measures. Their hands-on role is relevant to risk minimization and patient comfort enhancement in high-anxiety conditions.

In order to stay up to date and grow in expertise, the nurses must pursue study and practice in the

advanced practice of the management of anxiety. Sedation training or post-registration Cognitive Behavioral Therapy training allows nurses to achieve advanced expertise to manage complex cases like phobia in special needs patients or special patients (NHS England, 2023). Continuing professional development brings the nurses up to date at the cutting edge of evidence-based practice, and they in turn practice the pharmacological interventions and the non-pharmacological interventions effectively.

The value added by the initiative of the dental nurses is also emphasized by the evidence of the value of relationships abundant in trust. Bryne et al. (2021), in one study, found positive attitude of the dental nurses to be at the top priority to patient happiness and treatment compliance, where 80% of patients were more assured of effective dentistry by the support of knowledgeable nursing staff. By the addition of assessment, communication, delivering interventions, sedation support, and ongoing education, the dental nurses assume the central position in the management of the holistically managed dental phobia, hence enhancing patient outcomes and the positive experience of dentistry. Figure 1. Summarizes the role of nurses in dental anxiety management.

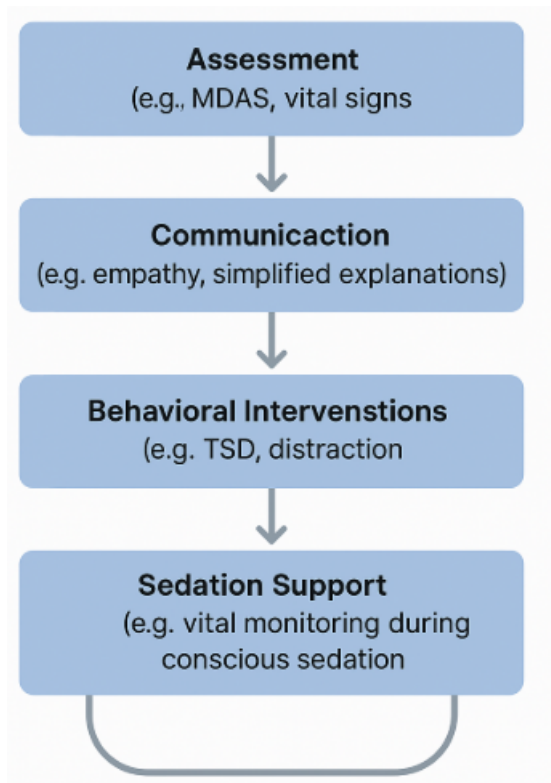


Figure 1. The role of nurses in dental anxiety management.

6. Future Direction

Aside from innovations in the management of anxious dentistry, there is still room for future research. First, more high-grade RCTs would enable the validation of the evidence for non-drug approaches in children (Prado et al., 2019). Second, the application of technology, including distraction in virtual reality, has promise but requires more study (Cunningham et al., 2021). Third, standardized training in the application of CBT and sedation styles for the dental nurse would render them more competent in managing the anxious patient (NHS England, 2023). Finally, cultural and socioeconomic predictors for the awareness of anxious dentistry would enable easier access to the more populated patient group from various backgrounds (Beaudette et al., 2017).

7. Conclusion

Dental phobia is the strongest deterrent to oral health service, and effective management must be multi-layered and carry nursing interventions and sedation assistance. Non-pharmacological interventions, including distraction, CBT, and TSD, have been extremely effective for mild to moderate levels of phobia, with sedation of full consciousness and general anesthesia being considered for higher grades. The role of the dental nurse in the assessment procedure of the phobia, implementation of interventions, and assistance in sedation activities has been essential in enhancing patient outcomes. Future studies would be beneficial in pediatric interventions, technology developments, and standardized training to optimize management of phobia of the teeth.

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