

EXPLORING DENTAL FEAR AND PHOBIA: CAUSES, DIAGNOSIS, AND IMPACT ON HEALTH AND SOCIETY

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Abstract

Dental fear, anxiety, and phobia represent significant psychological barriers that impede access to dental care, leading to adverse oral health outcomes and reduced quality of life. This study explores the etiology, diagnosis, and multifaceted impact of these conditions. Dental fear is characterized as a reaction to a known threat, anxiety as apprehension about the unknown, and phobia as a severe, persistent fear leading to complete avoidance. Causes are multifactorial, including direct traumatic experiences, indirect influences, psychological predispositions, and biological factors. Diagnosis relies on clinical assessment and standardized instruments such as the MDAS and CFSS-DS. The consequences extend beyond oral health, affecting general health, psychological well-being, social functioning, and economic efficiency. Management strategies encompass behavioral, cognitive, pharmacological, educational, and environmental approaches tailored to individual needs. The article underscores the importance of early intervention, preventive measures, and interdisciplinary collaboration to address dental fear as a critical public health issue.

Keywords: Dental fear, dental anxiety, dental phobia, oral health, psychological barriers, management strategies, public health.

INTRODUCTION

Despite significant technological advances in modern dentistry, dental fear and anxiety remain prevalent psychological barriers that negatively affect patients' willingness to seek dental care. Many individuals still associate dental treatment with unpleasant emotional sensations and pain, leading to avoidant behaviors and poorer oral health-related quality of life (Avramova, 2022). This article explores the complex nature of dental fear, anxiety, and phobia, examining their causes, diagnostic criteria, and the profound impact they have on both individual health outcomes and broader societal implications. Dental fear exists on a spectrum, ranging from mild anxiety to severe phobia, with each level requiring different approaches to management. According to Steimer (2002), four elements are common to all fears: the fear of physical harm or injury, fear of the unknown, fear of. Understanding these elements is crucial for effectively addressing dental fear and anxiety in clinical settings. The significance of this topic becomes apparent when considering that dental fear is one of the most common reasons many patients delay or avoid dental treatment (Appukuttan, 2016; Seligman et al., 2017). This avoidance behavior can lead to deteriorating oral health, which in turn affects overall health,

quality of life, and social functioning (Panda et al., 2021). As such, dental fear represents not only a clinical challenge but also a significant public health concern.

Differentiating Dental Fear, Anxiety, and Phobia

While the terms dental fear, anxiety, and phobia are often used interchangeably in everyday discourse, they represent distinct psychological states with important clinical differences. Understanding these distinctions is essential for proper diagnosis and treatment (Avramova, 2022).

Dental Fear

Dental fear is a reaction to a specific, immediately present danger or stimulus. As Avramova (2022) notes, it can be described as "I know what the dentist will do to me. I've been there before, and I've experienced it. I'm scared!" This form of fear includes a response related to threatening stimuli that the patient has previously encountered. Fear is more grounded in biological reactions compared to anxiety, though there is significant overlap between these states (Steimer, 2002).

Dental Anxiety

Dental anxiety represents a reaction to unknown danger or anticipatory anxiety about potential future dental procedures. Most people experience some degree of dental anxiety, especially if they are about to undergo an unfamiliar dental procedure (Avramova, 2022). This state is characterized by feelings of tension and apprehension about dental visits without a clear focus on specific dental stimuli. Dental anxiety is extremely common and often manifests as excessive worry about what might happen during a dental appointment.

Dental Phobia

Dental phobia (dentophobia) is defined as a persistent, unrealistic, and strong fear of a specific stimulus, leading to complete avoidance of perceived dental danger (Avramova, 2022). According to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), phobia is an anxiety disorder provoked primarily by well-defined situations or objects that do not pose actual danger in real time (First, 2013). Someone with dental phobia will avoid dental care at all costs until the physical problem or psychological burden becomes unbearable. This condition is more severe and debilitating than dental fear or anxiety, often meeting the clinical criteria for a specific phobia as classified in the DSM-5.

Dental phobia is characterized by an immediate anxiety response when exposed to the phobic stimulus, recognition that the fear is excessive or unreasonable, and significant interference with the individual's normal routine, occupational functioning, or social activities (First, 2013). The fear, anxiety, or avoidance is typically persistent, lasting for six months or more.

Manifestations and Clinical Features

The manifestations of dental fear, anxiety, and phobia can be categorized into several domains as described by Avramova (2022) and Kurki et al. (2021):

Emotional Manifestations

Patients experiencing dental fear often report painful feelings of tension and anxiety. These emotional responses can range from mild uneasiness to intense distress and panic. Patients may express feelings of dread, worry, or catastrophic thinking about dental procedures. In severe cases, patients may experience emotional distress even when merely thinking about dental treatment or scheduling an appointment.

Physiological Manifestations

The vegetative or physiological responses to dental fear include dilated pupils, pale face, sweating, accelerated respiratory rate, increased heart rate, and changes in blood pressure (Avramova, 2022). These autonomic nervous system reactions are part of the body's "fight-or-flight" response to perceived threats. In severe cases, patients may experience symptoms resembling panic attacks, including chest pain, dizziness, and feelings of unreality.

Behavioral Manifestations

Psychomotor manifestations of dental fear include anxious facial expressions, psychomotor agitation or stiffness, avoidance of eye contact, nervous movements of arms and legs, and squeezing the dental chair (Avramova, 2022). Some patients may become very talkative as a means of relieving tension, while others may display more aggressive or hostile behavior. The most significant behavioral manifestation is avoidance of dental care altogether, which can range from delayed appointments to complete refusal of treatment.

These manifestations can significantly complicate dental care delivery, leading to interrupted treatments, difficulty in achieving optimal results, and strained dentist-patient relationships. Understanding these clinical features helps dental professionals recognize dental fear in patients and implement appropriate management strategies.

Causes and Etiology of Dental Fear and Phobia

The development of dental fear, anxiety, and phobia is multifactorial, involving a complex interplay of personal experiences, psychological factors, and biological predispositions. Understanding these underlying causes is crucial for effective prevention and management strategies.

Direct Experiences

One of the most significant pathways to developing dental fear is through direct negative or traumatic experiences with dental treatment (Beaton et al., 2014). These experiences may include:

- Painful dental procedures, particularly those experienced during childhood
- Treatments performed without adequate pain control
- Negative interactions with dental professionals, including humiliation or perceived lack of empathy
- Unexpected complications during dental procedures

Avramova (2022) highlights that a negligent dentist who has caused pain or damage to a patient's tooth can create lasting traumatic memories that maintain a constant level of tension and fear during subsequent dental visits.

Indirect Influences

Dental fear can also develop through indirect pathways, even without personal negative experiences. These include:

- Observational learning from witnessing others' fear reactions to dental treatment
- Negative information transmitted through family members, friends, or media portrayals
- Cultural attitudes that reinforce stereotypes of dental treatment as inherently painful

Murad et al. (2020) note that rumors and information from relatives, friends, and media can significantly contribute to the development of dental anxiety, even in individuals who have not had negative dental experiences themselves.

Psychological Factors

Several psychological factors can predispose individuals to dental fear and phobia:

- General anxiety disorders and other pre-existing mental health conditions
- Personality traits such as neuroticism and negative affectivity (Mihaylova et al., 2018)
- Poor coping strategies and low stress tolerance
- Fear of loss of control in the dental setting
- Embarrassment about oral health status or fear of judgment

Vasileva (2018) found that personality traits and anxiety levels significantly impact dental health behaviors and outcomes, suggesting that psychological factors play a crucial role in dental fear development.

Biological and Genetic Factors

There is evidence suggesting biological and genetic contributions to dental fear and phobia:

- Family history of dental phobia increases the risk threefold (Crowe, 1985)
- Hereditary patterns are particularly notable in blood phobias, injuries, injections, and dental phobias
- Neurobiological factors affecting fear conditioning and extinction processes
- Individual variations in pain sensitivity and threshold

According to Fredrikson et al. (1996), specific fears and phobias show heterogeneity in terms of gender and age distribution, suggesting potential biological influences on their development.

Classification of Dental Phobia Types

Moore et al. (1991) defined four types of dental phobia based on their etiological pathways:

1. **Fear of specific stimuli:** Fear triggered by specific painful or unpleasant stimuli such as needles, dental drills, or certain sounds and smells associated with dental treatment.
2. **Anxiety from somatic reactions:** Fear of potential physiological reactions during dental treatment, such as allergic reactions to local anesthesia, seizures, or panic attacks.
3. **Anxiety related to general anxiety disorders:** Dental fear as a manifestation of broader anxiety issues or multifactorial phobias.
4. **Social anxiety in dental settings:** Lack of trust in dental staff caused by social phobias or past negative interpersonal experiences in dental settings.

Another classification system differentiates between exogenous and endogenous dental phobias (Beaton et al., 2014). Exogenous dental phobia stems from traumatic dental experiences or indirect influences, while endogenous dental phobia originates from other anxiety disorders or is based on hereditary factors and personality traits.

Diagnostic Criteria and Assessment

Accurate diagnosis of dental fear, anxiety, and phobia is essential for appropriate management and treatment planning. The diagnosis typically involves clinical assessment, structured interviews, and standardized psychometric instruments.

Clinical Assessment

Clinical assessment involves a comprehensive evaluation of the patient's dental history, psychological background, and current symptoms. Key aspects of clinical assessment include:

- Detailed dental history, focusing on past traumatic experiences
- Evaluation of avoidance behaviors related to dental care
- Assessment of physiological, emotional, and behavioral responses to dental stimuli
- Identification of specific triggers or feared aspects of dental treatment
- Screening for comorbid anxiety disorders or other psychological conditions

Diagnostic Criteria

According to the DSM-5 (First, 2013), the diagnostic criteria for specific phobia, which includes dental phobia, are:

1. Marked fear or anxiety about a specific object or situation (in this case, dental procedures or dental settings)
2. The phobic object or situation almost always provokes immediate fear or anxiety
3. The fear or anxiety is out of proportion to the actual danger posed
4. The phobic object or situation is actively avoided or endured with intense fear or anxiety
5. The fear, anxiety, or avoidance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning
6. The fear, anxiety, or avoidance is persistent, typically lasting for six months or more
7. The symptoms are not better explained by another mental disorder

Avramova (2022) notes that physical symptoms of anxiety or panic attacks in the presence of the phobic stimulus, tension of anticipation, and persistent avoidance behavior for six months or more are key diagnostic indicators of dental phobia.

Psychometric Instruments

Several validated psychometric instruments are commonly used to assess dental fear and anxiety:

1. **Children's Fear Survey Schedule–Dental Subscale (CFSS-DS):** A widely used instrument for measuring dental fear in children, consisting of 15 items related to various aspects of dental treatment (Panda et al., 2021).
2. **Modified Dental Anxiety Scale (MDAS):** A five-item questionnaire assessing anxiety levels associated with different dental situations, commonly used in adult populations.
3. **Dental Anxiety Scale (DAS):** A four-item scale measuring dental anxiety, particularly focused on anticipatory anxiety before dental appointments.
4. **Dental Fear Survey (DFS):** A 20-item instrument assessing physiological, cognitive, and behavioral aspects of dental fear.

These assessment tools help quantify the severity of dental fear and anxiety, identify specific triggers, and evaluate treatment outcomes. Panda et al. (2021) used the CFSS-DS to assess dental fear in schoolchildren, finding that higher scores on this scale were significantly associated with untreated dental caries.

Medical and Social Impact

The consequences of dental fear, anxiety, and phobia extend far beyond the dental chair, affecting individuals' overall health, quality of life, and social functioning. Understanding these impacts is crucial for appreciating the significance of addressing dental fear as a public health concern.

Impact on Oral Health

Dental fear often leads to avoidance of dental care, resulting in deteriorated oral health outcomes:

- Increased prevalence of untreated dental caries (Panda et al., 2021)
- Higher rates of periodontal disease
- Greater tooth loss and edentulism
- More dental emergencies and complications
- Need for more extensive and invasive dental treatments when care is finally sought

Panda et al. (2021) found that children with dental fear were 1.8 times more likely to have untreated dental caries compared to those without fear. This pattern of avoidance creating a cycle of worsening oral health is consistent across age groups and populations.

Impact on General Health

Poor oral health resulting from dental fear can have significant implications for general health:

- Associations between periodontal disease and systemic conditions like cardiovascular disease and diabetes
- Nutritional deficiencies due to compromised chewing ability
- Chronic inflammation potentially affecting multiple body systems
- Pain and discomfort affecting sleep, mood, and overall well-being

Avramova (2022) notes that chronically inflamed gums and broken teeth affect general health, and difficulty chewing can cause serious digestive disorders, highlighting the systemic implications of untreated dental problems.

Psychological and Social Impact

Dental fear and its consequences can significantly affect psychological well-being and social functioning:

- Reduced self-esteem and self-confidence due to poor dental appearance
- Social embarrassment and isolation
- Communication difficulties due to dental problems affecting speech
- Occupational disadvantages due to dental appearance or pain
- Overall reduced quality of life

Avramova (2022) emphasizes that bad breath and compromised smiles affect self-esteem during social interactions, while dental problems can affect speech and correct diction, highlighting the social dimensions of dental fear's impact.

Economic Impact

The economic burden of dental fear extends to both individuals and healthcare systems:

- Higher treatment costs due to more complex procedures needed when care is delayed
- Productivity losses due to dental pain and associated complications
- Emergency department visits for preventable dental conditions
- Inefficient use of healthcare resources

Horenstein and Heimberg (2020) noted that anxiety disorders, including dental phobia, are associated with inconsistent healthcare utilization patterns, which can lead to increased costs and reduced efficiency in healthcare delivery.

Impact on Dental Professionals

Dental fear also affects dental healthcare providers:

- Increased stress and professional burnout when treating anxious patients
- More challenging treatment conditions and potentially compromised outcomes
- Need for additional time and resources to manage patient anxiety
- Reduced professional satisfaction when patients avoid necessary care

These multifaceted impacts underscore the importance of addressing dental fear not only as a clinical concern but as a significant public health issue with far-reaching implications for individual and community well-being.

Management Strategies and Interventions

Effectively managing dental fear, anxiety, and phobia requires a multidimensional approach tailored to the individual's specific needs and the severity of their condition. Various strategies have been developed to address dental fear across the spectrum from mild anxiety to severe phobia.

Behavioral and Cognitive Approaches

Behavioral and cognitive interventions focus on modifying fear responses through psychological techniques:

- **Cognitive-behavioral therapy (CBT):** Helps patients identify and challenge irrational thoughts about dental treatment and develop more adaptive thinking patterns.
- **Systematic desensitization:** Gradually exposes patients to feared dental stimuli in a controlled manner while teaching relaxation techniques to counter anxiety responses.
- **Relaxation training:** Teaches patients techniques like progressive muscle relaxation, deep breathing, and guided imagery to reduce physiological arousal during dental visits.
- **Biofeedback:** Provides patients with real-time information about their physiological responses, helping them learn to control physical manifestations of anxiety.

Appukuttan (2016) emphasizes that evidence-based cognitive-behavioral techniques can be effective guided therapy to address dental fear and anxiety among patients of all ages.

Pharmacological Approaches

Pharmacological interventions can help manage severe dental anxiety and phobia, particularly in cases where psychological approaches alone are insufficient:

- **Anxiolytic medications:** Benzodiazepines and other anti-anxiety medications may be prescribed for short-term management of dental anxiety.
- **Conscious sedation:** Various levels of sedation, including nitrous oxide (laughing gas), oral sedatives, or intravenous sedation, can help manage anxiety during dental procedures.
- **General anesthesia:** In extreme cases of dental phobia, general anesthesia may be considered for necessary dental treatment.

Uguz et al. (2005) found that short-term antidepressant treatment was effective in reducing dental anxiety in patients with comorbid panic disorder, suggesting the potential utility of pharmacological approaches in certain populations.

Educational and Informational Strategies

Education and information provision can help demystify dental procedures and reduce fear of the unknown:

- **Detailed explanations of procedures:** Clear information about what to expect during dental treatment can reduce anticipatory anxiety.

- **Tell-show-do technique:** Especially effective with children, this approach involves explaining a procedure, demonstrating it on a model, and then performing it.
- **Educational materials:** Brochures, videos, and websites providing accurate information about dental procedures can help counter misconceptions.

Jones and Huggins (2014) highlight the importance of communication and empathy in the dentist-patient relationship, noting that effective information provision can significantly reduce dental anxiety.

Environmental and Practice-Based Approaches

The dental practice environment and practitioner approach can significantly influence patient anxiety:

- **Creating a calming atmosphere:** Soothing music, pleasant scents, and comfortable surroundings can reduce environmental triggers of anxiety.
- **Establishing control signals:** Giving patients a way to signal when they need a break can enhance feelings of control during treatment.
- **Building trust through communication:** Empathetic listening, validation of concerns, and transparent communication help build trust and reduce anxiety.
- **Pain management focus:** Emphasizing effective pain control and ensuring patients are comfortable throughout procedures is essential for preventing trauma.

Karnad (2015) discusses various practice-based strategies for managing dental anxiety, emphasizing the importance of the dentist's demeanor and communication style in creating a positive experience for anxious patients.

Special Considerations for Children

Children with dental fear require age-appropriate management strategies:

- **Parental involvement:** Preparing parents to support their children effectively during dental visits, avoiding transmission of their own dental anxiety.
- **Child-friendly environment:** Colorful decorations, toys, and child-appropriate language can make the dental setting less intimidating.
- **Positive reinforcement:** Praise and small rewards for cooperative behavior can build positive associations with dental visits.
- **Modeling:** Allowing children to observe other children or siblings successfully completing dental treatment can reduce fear through vicarious learning.

Panda et al. (2021) suggest that community-based programs to familiarize children and their parents with dental procedures could help reduce dental fear in pediatric populations.

Preventive Approaches

Prevention of dental fear through positive early experiences and public health initiatives is ideal:

- **Early positive dental visits:** Non-threatening introductory visits focused on prevention rather than treatment.
- **School-based dental education programs:** Teaching children about oral health and dental procedures in a non-threatening environment.
- **Public awareness campaigns:** Addressing misconceptions about dental treatment and promoting regular dental care.
- **Professional education:** Training dental professionals in techniques for managing anxious patients and preventing traumatic experiences.

Panda et al. (2021) emphasize the need for effective public health programs addressing factors like improved parenting, dental literacy, dietary behaviors, and oral hygiene practices to break the cycle of dental fear and poor oral health.

Future Directions and Research Needs

Despite significant advances in understanding dental fear and its management, several areas require further research and development:

1. **Improved assessment tools:** Development of more precise instruments for differentiating between dental fear, anxiety, and phobia, particularly in diverse populations and age groups.
2. **Personalized interventions:** Research on matching specific interventions to individual patient characteristics and fear profiles for optimized outcomes.
3. **Digital interventions:** Exploration of virtual reality, apps, and other digital tools for preventing and treating dental fear.
4. **Interdisciplinary approaches:** Better integration of dental care with psychological services for comprehensive management of dental phobia.
5. **Cultural considerations:** Research on cultural variations in dental fear manifestations and culturally sensitive interventions.
6. **Long-term outcomes:** Longitudinal studies on the effectiveness of various interventions in sustainably reducing dental fear and improving oral health outcomes.

CONCLUSION

Dental fear, anxiety, and phobia represent significant barriers to oral healthcare that affect individuals across the lifespan. From mild anxiety to debilitating phobia, these conditions can lead to avoidance of necessary dental care, resulting in deteriorated oral health, reduced quality of life, and broader health implications. Understanding the differential diagnostic characteristics, specific causes, and multifaceted impacts of dental fear is essential for addressing this important public health issue.

The evidence reviewed in this article highlights the complex etiology of dental fear, involving direct experiences, indirect influences, psychological factors, and biological predispositions. Assessment and diagnosis require comprehensive approaches that consider the spectrum of fear responses and their manifestations across emotional, physiological, and behavioral domains.

Management strategies must be multidimensional, incorporating behavioral, cognitive, pharmacological, educational, and environmental approaches tailored to individual needs. Special attention to vulnerable populations, particularly children, is essential for breaking the cycle of dental fear and establishing lifelong positive dental care habits.

As dental professionals and researchers continue to develop and refine approaches to dental fear management, greater emphasis on prevention, early intervention, and interdisciplinary collaboration will be crucial. By addressing dental fear effectively, we can improve not only oral health outcomes but also overall quality of life and well-being for millions of affected individuals worldwide.

REFERENCES

1. Appukuttan, D. P. (2016). Strategies to manage patients with dental anxiety and dental phobia: literature review. *Clinical, Cosmetic and Investigational Dentistry*, 8, 35-50. <https://doi.org/10.2147/CCIDE.S63626>
2. Avramova, N. T. (2022). Dental Fear, Anxiety, and Phobia; Causes, Diagnostic Criteria and the Medical and Social Impact. *Journal of Mind and Medical Sciences*, 9(2), 202-208. <https://doi.org/10.22543/2392-7674.1348>
3. Beaton, L., Freeman, R., & Humphris, G. (2014). Why are people afraid of the dentist? Observations and explanations. *Medical Principles and Practice*, 23(4), 295-301. <https://doi.org/10.1159/000357223>
4. Carter, A. E., Carter, G., Boschen, M., AlShwaimi, E., & George, R. (2014). Pathways of fear and anxiety in dentistry: A review. *World Journal of Clinical Cases*, 2(11), 642-653. <https://doi.org/10.12998/wjcc.v2.i11.642>
5. Crowe, R. R. (1985). The genetics of panic disorder and agoraphobia. *Psychiatric Development*, 3(2), 171-185.
6. First, M. B. (2013). Diagnostic and statistical manual of mental disorders, 5th edition, and clinical utility. *Journal of Nervous and Mental Disease*, 201(9), 727-729. <https://doi.org/10.1097/NMD.0b013e3182a2168a>
7. Fredrikson, M., Annas, P., Fischer, H., & Wik, G. (1996). Gender and age differences in the prevalence of specific fears and phobias. *Behaviour Research and Therapy*, 34(1), 33-39. [https://doi.org/10.1016/0005-7967\(95\)00048-3](https://doi.org/10.1016/0005-7967(95)00048-3)
8. Horenstein, A., & Heimberg, R. G. (2020). Anxiety disorders and healthcare utilization: A systematic review. *Clinical Psychology Review*, 81, 101894. <https://doi.org/10.1016/j.cpr.2020.101894>
9. Jones, L. M., & Huggins, T. J. (2014). Empathy in the dentist-patient relationship: review and application. *New Zealand Dental Journal*, 110(3), 98-104.
10. Karnad, M. P. (2015). Dental anxiety--how would you manage it? *SAAD Digest*, 31, 26-31.
11. Kurki, P., Korhonen, M., Honkalampi, K., & Suominen, A. L. (2021). Patients' multifaceted views of dental fear in a diagnostic interview. *Acta Odontologica Scandinavica*, 79(3), 194-204. <https://doi.org/10.1080/00016357.2020.1817545>
12. Mihaylova, I., Avramova, N., & Vasilev, B. (2018). Personality Traits and Dental Anxiety. *IOSR Journal of Dental and Medical Sciences*, 17(2), 8-10. <https://doi.org/10.9790/0853-1702040810>
13. Moore, R., Brødsgaard, I., & Birn, H. (1991). Manifestations, acquisition and diagnostic categories of dental fear in a self-referred population. *Behaviour Research and Therapy*, 29(1), 51-60. [https://doi.org/10.1016/s0005-7967\(09\)80007-7](https://doi.org/10.1016/s0005-7967(09)80007-7)
14. Murad, M. H., Ingle, N. A., & Assery, M. K. (2020). Evaluating factors associated with fear and anxiety to dental treatment-A systematic review. *Journal of Family Medicine and Primary Care*, 9(9), 4530-4535. https://doi.org/10.4103/jfmpe.jfmpe_607_20
15. Panda, S., Quadri, M. F. A., Hadi, I. H., Jably, R. M., Hamzi, A. M., & Jafer, M. A. (2021). Does Dental Fear in Children Predict Untreated Dental Caries? An Analytical Cross-Sectional Study. *Children*, 8(5), 382. <https://doi.org/10.3390/children8050382>

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16. Seligman, L. D., Hovey, J. D., Chacon, K., & Ollendick, T. H. (2017). Dental anxiety: An understudied problem in youth. *Clinical Psychology Review*, 55, 25-40. <https://doi.org/10.1016/j.cpr.2017.04.004>
 17. Steimer, T. (2002). The biology of fear- and anxiety-related behaviors. *Dialogues in Clinical Neuroscience*, 4(3), 231-249. <https://doi.org/10.31887/DCNS.2002.4.3/tsteimer>
 18. Uguz, S., Seydaoglu, G., Doğan, C., Inanc, B. Y., Yurdagul, E., & Diler, R. S. (2005). Short-term antidepressant treatment of comorbid dental anxiety in patients with panic disorder. *Acta Odontologica Scandinavica*, 63(5), 266-271. <https://doi.org/10.1080/00016350510020007>
 19. Vasileva, I. M. (2018). Personality traits, levels of anxiety and their impact on dental health in people over 18 years of age. [PhD Thesis]. Medical University-Sofia.