

The Impact of Psychiatric Disorders on Oral Health

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Abstract

Mental disorders such as depression, anxiety, schizophrenia, bipolar disorder and dementia increase the risk of oral and dental diseases, leading to poor hygiene, dental caries and periodontal disease. Understanding the impact of these disorders is crucial for holistic healthcare and to guide dentists in providing effective treatments. This chapter examines the relationship between psychiatric disorders, stress, eating disorders, antipsychotic medications and communication with patients. It also discusses the potential impact of depression, anxiety and schizophrenia on oral health, stress, bruxism, eating disorders and the management of side effects such as dry mouth.

INTRODUCTION

Mental health is essential for coping with life's stresses, learning, and contributing to society. It is influenced by various factors, including individual, family, and community factors. Adverse circumstances like poverty, violence, disability, and inequality increase the risk of developing mental health conditions. Despite effective treatment, under-resourced health systems and poor quality care often lead to stigma and discrimination (1).

According to the most recent World Mental Health Report published by the World Health Organization (WHO) (2), about one in eight adults and adolescents globally, or one billion people, suffer from a mental illness. The two largest groups are those suffering from anxiety (301 million) and depression (280 million), although millions of people worldwide are also affected by behavior issues, bipolar illness, schizophrenia, attention-deficit hyperactivity disorder, and developmental disabilities. These diseases have

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a significant disease burden. Among all ailments, mental disorders account for the majority of “years lived with disability” (YLDs). One in six YLDs are caused by a mental disorder. Furthermore, because this population has a notably greater rate of early mortality, the real illness burden of mental diseases is significantly larger (3). In the United States, more than one in five individuals suffer from a mental disease. They are divided into two categories: Serious Mental Illness (SMI), which is a more severe subgroup, and Any Mental Illness (AMI), which ranges from moderate to severe. 57.8 million American people who were 18 years of age or older (22.8% of the population) had an AMI in 2021. The incidence was greater in women (27.2%) and lowest in young adults (18–25) (33.7%). American Indian/Alaska Native (AI/AN) people (26.6%) and those identifying two or more racial identities (34.9%) had the highest AMIs. The lowest frequency (16.4%) was seen in Asian adults (4).

One essential human right is the ability to receive healthcare services. This is especially crucial for this susceptible population of mental health patients, as stigma and prejudice frequently make it difficult for them to get the care they need (5,6). There are more risk factors for dental and oral illnesses present in these people. These include drug side effects, neglecting oneself, finding it difficult to get care, attitudes against medical experts, and unwillingness to cooperate during dental procedures (5-7).

Mental health issues like anxiety and depression affect a significant portion of the global population, influenced by various mechanisms like the autonomic nervous system, immunology, and hypothalamic-pituitary-adrenal axis, lifestyle choices, environmental factors, and life events. These conditions may result in worsening periodontal disease and less successful repair. Periodontal disease can also result from behavioral changes including smoking, drinking too much alcohol, and maintaining poor oral hygiene. Mental health issues may also be influenced by the oral microbiota (8).

Research shows that oral health is crucial for overall health and well-being. It has multi-organ systemic implications, ranging from insulin resistance to cardiovascular complications. Improving oral health could lead to significant systemic implications for organisms, prevention of pathologies, society, and individual quality of life. Recent findings support this interpolation between oral health, diseases, and systemic complications (9). Oral health affects many aspects such as speaking, eating and social and psychological aspects of life. Amotivation, poor oral hygiene, dread, particular dental phobias, dental expenditures, difficulties accessing healthcare facilities, and side effects from psychiatric medications are some of the variables that make people with severe

mental illness vulnerable to oral disease. The two diseases most commonly reported to affect oral health are periodontal illness and tooth decay. Plaque accumulation causes demineralization and proteolysis of the hard tooth structure, which leads to dental caries. Gingivitis, an inflammation of the gingival tissues brought on by a buildup of tooth plaque over time, is the first sign of periodontal disease. Inflammation can spread to the periodontal ligament in patients with bacterial microbiota, destroying the surrounding bone and connective tissues. Periodontal disease symptoms include pockets where gingivae have separated from teeth and bleeding gums (10-13).

The relationship between the body and mind is increasingly recognized in medicine. Psychiatry and dentistry interact to address the impact of psychiatric conditions on oral health. Depression, anxiety, and stress can worsen oral health problems and affect an individual's psychological state, leading to loss of self-confidence. In dentistry, patients often face emotional difficulties. This chapter examines how mental illnesses affect dental health and offers recommendations for dentists on how to manage these consequences. It discusses the relationship between psychiatric disorders, such as depression, anxiety, and schizophrenia, and their potential effects on oral health. It also discusses the potential threats to oral health caused by stress and bruxism, such as dental erosion and jaw pain. Eating disorders like bulimia nervosa and anorexia nervosa can significantly impact oral health, leading to enamel erosion due to stomach acid exposure. The chapter also discusses the role of antipsychotic medications in treating psychiatric disorders and their side effects, such as dry mouth. The chapter also emphasizes the importance of effective communication skills for dentists dealing with patients with psychiatric disorders. Practical recommendations on understanding psychiatric conditions, building empathy, and providing appropriate support can enhance dentists' contributions to the treatment of these patients.

1. The Link Between Psychiatric Disorders and Oral Health

Mental illnesses can affect a person's functioning, behavior, and oral health, which can result in a preference for certain activities above personal hygiene, such as eating and sleeping. 75.8% of participants in the survey utilized a toothbrush and toothpaste as oral hygiene tools, while 92.5% were not aware of how often brushing is advised. Although this lack of awareness and motivation may exacerbate problems with oral health, its impact on psychological health is minimal, and in some circumstances, it may not receive the necessary attention (14,15). In a research conducted at Jimma University Specialized Hospital in Ethiopia, it was discovered that

mental patients' dental health was subpar. Dental exams were employed in this 240-person research to assess the community periodontal index (CPI) and the decaying, misshapen, and filled teeth (DMFT) index. The average DMFT score was 1.94 ± 2.12 , with values of 1.28 ± 1.69 for decaying teeth, 0.51 ± 1.19 for missing teeth, and 0.14 ± 0.48 for filled teeth, respectively. The CPI score of just 24% of mental patients was healthy (14).

Dental health can be impacted by a variety of mental health issues, such as anxiety, depression, and schizophrenia. A meta-analysis research revealed that individuals with severe mental illness had a 3.4 times higher risk of losing all of their teeth than people in the general population. Additionally, they have significantly higher scores for surfaces missing (DMF) and DMFT scores (16).

Psychiatric patients' quality of life satisfaction and dental health were evaluated in a research conducted in Indore, Central India. This study found that individuals with a diagnosis of schizophrenia had the highest mean OHIP ratings in terms of handicap, psychological pain, physical disability, psychological disability, and social impairment. The study highlights how crucial it is to include oral health education in programs for mental recovery (17).

All mental illnesses were associated with increased rates of tooth loss and dental decay, according to a meta-analysis of research on the oral health of individuals with prevalent psychological problems like anxiety and depression. This study found no association between periodontal disease and any condition other than panic disorder. Some of the drawbacks include the cross-sectional design, varied outcomes, and a dearth of studies to test for publication bias. The study suggests that treating mental health patients' physical health should be given more priority and that dental and medical practitioners should collaborate to improve oral health (18).

In a comprehensive examination encompassing 25 studies conducted over the last quarter-century, a systematic review and meta-analysis unveiled a heightened susceptibility to tooth loss and decay among individuals grappling with severe mental illness (SMI) in comparison to the general population. The investigation identified that individuals with SMI exhibited a 2.8-fold increase in the odds of losing all their teeth, coupled with notably elevated scores for decayed, missing, and filled teeth and surfaces. Consequently, the study advocates for an augmented emphasis on physical health interventions, underscoring the imperative inclusion of oral health considerations. This entails proactive measures such as oral health assessments, provision of oral hygiene assistance, effective management of iatrogenic dry mouth, and

timely initiation of dental referrals to mitigate and address the heightened oral health risks observed in this population (19).

The brain, immune system, and gut interactome can be impacted by the microbiome, a community of bacteria on mucosal surfaces that plays a major role in inflammation. Modulating environmental interactions, the microbiome has evolved to play a critical function in the host immune system. The oral cavity's microbiome can affect systemic inflammation and the host's reaction to external stimuli, perhaps aiding in the development of brain illnesses, even though the majority of research concentrate on fecal samples (20-24). Studies including people with mental illnesses, as well as nonpsychiatric controls, have shown that changes in the gut and oral microbiota, plasma cytokines, and hippocampus inflammatory processes influence the molecular and clinical markers of symptoms linked to schizophrenia (25). The study used a transdiagnostic approach to examine the Positive and Negative Syndrome Scale (PANSS) in order to quantify these elements. Psychiatric patients showed elevated gut alpha diversity and an enrichment of harmful species in the oral microbiome, an accurate phenotypic classifier. The findings support the hypothesis that the gut, brain, and microbiome axis and mental symptomatology are related in a transdiagnostic manner (25).

Martin et al.'s study (24) delves into the influence of the oropharyngeal microbiome on schizophrenia, exploring the potential bidirectional relationship between the oral microbiota and the brain within the context of dysbiosis-related neuroinflammation. Five primary research areas are covered in this extensive study: Oropharyngeal phagoma; salivary microbiome; oropharyngeal microbiome; potential associations between periodontal disease and schizophrenia; and interactions between medications and the microbiome. By carefully analyzing these elements, the study aims to clarify the intricate connections between oral microbial communities and schizophrenia. The findings support the theory that inflammation plays a key pathophysiological role in schizophrenia. Notably, the study shows that phageomas are present in people with schizophrenia, offering important new information about the intricate relationship between oral microbiota and the pathophysiology of schizophrenia. A promising substrate for characterizing the various stages of schizophrenia is saliva. But it's still difficult to prove a clear-cut bidirectional relationship between the brain and the oral microbiota because of the current narrow scope of research.

A research that examined at the oropharyngeal microbiome in 316 people with mania and schizophrenia discovered that the microbiome's

abundance and composition were different from controls'. Five bacterial taxa that varied among the diagnostic groupings were also found in the research. In people with schizophrenia or mania, the numbers of *Neisseria subflava*, *Wecksellaceae*, and *Prevotella* dropped, whereas the numbers of streptococci rose. *Schlegelella* was exclusive to manic patients. *N. subflava* showed a favorable correlation with cognitive performance. According to the study, knowing the biology of the microbiome may aid in the prevention and treatment of various illnesses (23).

A prior study revealed no influence on periodontitis and no causal relationship between genetically determined periodontitis and ten major psychiatric diseases. This study suggests a lack of evidence for a bidirectional causal relationship between mental illnesses and periodontitis, possibly due to various confounders (26).

In a study assessing oral health condition, self-perceived dental requirements, and barriers to using dental care among mental patients in Haryana, dental pain was found to be the most common complaint. Dental discomfort was reported by most patients, and the study concluded that it was the most prevalent dental issue. The study did discover, however, that the patients' dental health was not considerably impacted by the length of their sickness. The study's conclusions suggest that oral health issues among this underrepresented group are not sufficiently recognized and should receive more attention from the psychiatric community (27).

A comprehensive analysis of eleven meta-analyses revealed a robust correlation among individuals with mental illness between tooth decay, severe mental illness, substance abuse, erosion, and eating disorders.

In contrast to both the general population and individuals with depression, those afflicted by severe mental illness (SMI) face an almost threefold increased likelihood of complete tooth loss. Additionally, dental caries has been established as intricately connected to eating disorders, anxiety, and depressive conditions. The study underscores the importance of prioritizing oral health in the care of individuals with mental illness. Mental health professionals should actively advocate for referrals to affordable dental clinics and incorporate screenings for oral illnesses into their regular assessments. Emphasizing dental care promotion and addressing xerostomia when necessary should be integral components of preventative measures when managing patients with mental illness. This integrated approach seeks to mitigate the heightened oral health risks associated with severe mental illness and enhance the overall well-being of this vulnerable population (28).

Poor oral health, including dental caries and periodontal disease, has been ignored, according to a Malaysian investigation, even though people with chronic schizophrenia have high rates of physical illness, such as heart disease. In all, 543 individuals between the ages of 45 and 64 with an average disease duration of 18.4 years were included in the study. For teeth that were filled, missing, or rotting, the average score was 20.5, which is nearly twice as high as the population as a whole. According to the study, oral health issues, especially tooth decay, in people with schizophrenia should be treated with the same care as other coexisting medical conditions (29).

An examination of oral health parameters between general population participants and inpatients with schizophrenia was the goal of a Taiwanese study. The research employed the decayed, missing, and filled teeth index (DMFT) as a metric for measuring dental caries. Findings revealed that among schizophrenia inpatients aged 19 to 44, there were lower rates of dental fillings and a higher prevalence of dental caries compared to their counterparts in the disabled population. Conversely, individuals over the age of 45 exhibited a smaller mean number of decayed, missing, and filled teeth (DMFT), suggesting a potentially different oral health profile in this older age group within the schizophrenia inpatient population. Schizophrenia patients exhibited lower DMFT index and more caries experience than the normal group (30).

2. Stress and bruxism: Possible Threats to Oral Health

Bruxism, a stress-related disorder, can lead to tooth erosion, jaw pain, and other oral health issues. It is a circadian-onset repeated jaw-muscle activity that can lead to tooth loss, failed restorations, masticatory muscle soreness, migraines, and sleep disturbances. It lowers the quality of life for people and increases medical expenses (31-34). Finding bruxism and erosion during a dental exam is crucial. A management plan can be put in place to lessen the effects of both processes by knowing their etiologies. In order to treat bruxism, clenching, and parafunction, dental appliances, cognitive behavioral therapy, and medication may be used. When dental erosion is coupled with bruxism, clenching, and parafunction, dental wear can increase more quickly than it would with any one of these factors alone (33). Ohlmann et al. 'study aimed to identify associations between sleep bruxism, chronic stress, and sleep quality. Results showed no significant association between sleep bruxism and self-reported stress or sleep quality. However, a significant association was found between specific items of chronic stress and poor sleep quality. The study concluded that subjective sleep quality and subjective chronic stress are associated, regardless of sleep bruxism.

Clinical significance is that chronic stress and sleep quality do not seem to be associated with sleep bruxism (34). Kuhn and Türp's study identified four risk factors for bruxism, including emotional stress, tobacco consumption, sleep apnea syndrome, and anxiety disorders in adults (31).

According to a study done at the University of Medicine and Pharmacy of Craiova, young students who exhibit symptoms of temporo-mandibular disorder and bruxism—a repetitive muscle activity—have higher levels of stress. According to the study, 39.33% of participants self-reported having bruxism; 16.28% of them did so while they were sleeping, and 68.99% did so while they were awake. The primary sign of bruxism was grinding one's teeth (32). This cross-sectional study examined the prevalence of active sleep bruxism among male inmates in a Mysore penal facility and its effects on oral health-related quality of life (OHRQoL). The cohort comprised 212 male inmates aged 18 to 80 years. The findings revealed a noteworthy prevalence of active sleep bruxism at 31.6% within the studied population. Moreover, inmates with active sleep bruxism exhibited significantly higher mean scores on the modified Oral Health Impact Profile (OHIP-14), indicating a substantial negative impact on oral health compared to their counterparts without the disorder. The study's conclusion underscores the elevated occurrence of active sleep bruxism among penal institution inmates as opposed to the general population, emphasizing its detrimental effects on OHRQoL. This research advocates for further investigations into bruxism within the prison demographic to enhance our understanding of this phenomenon in such contexts (35).

In a previous study, patients with and without sleep bruxism (SB) and awake bruxism (AB) were compared with respect to oral health-related quality of life, sleep quality, and oral health literacy. This cross-sectional study, which took place at an Istanbul, Turkey family medical clinic, enrolled 249 volunteers. The Pittsburgh Sleep Quality Index, the DMFT score, the Oral Health-Related Quality of Life tool, the American Sleep Medicine Association Bruxism Diagnostic Criteria, and the Health Literacy Dental Scale-Short Form (HeLD-14) were the instruments used for the assessment. Results showed that patients had AB in 21.7% and SB in 41.4% of cases. Bruxers who grind their teeth while sleeping or while awake showed lower oral health-related quality of life, poorer sleep, and a higher DMFT score. AB and SB groups' oral health literacy scores were lower than those of people without bruxism, however, the disparity lacked statistical significance.

The study concluded that individuals may lack awareness regarding the adverse impact of SB or AB on their oral health-related quality of life and sleep quality (36).

In the United States, 25–28% of people experience chronic stress, which is a major risk factor for periodontal disorders. The biochemical, microbiological, and physiological effects of chronic stress disorders on oral tissues are being investigated, nevertheless, by contemporary studies. Growing data points to the possibility that persistent stress and associated conditions like anxiety and depression may play a major role in the development of periodontal and peri-implant disorders as well as irregular wound healing. Categorization of the disease process and de-escalation of chronic stress situations through coping mechanisms are ideal options for these patients (37).

3. Eating Disorders and the Relationship to Oral Health

Anorexia, bulimia, and binge eating disorders (EDs) are psychogenic illnesses that mostly affect teenagers. According to the WHO, these diseases are characterized by aberrant eating patterns, discomfort, and intense anxiety related to weight management, body image, and weight (38,39).

Some EDs, such as bulimia nervosa and anorexia nervosa, exert a significant and potentially deleterious impact on dental health. The corrosive effects of stomach acid exposure during episodes of purging can lead to enamel erosion, marking the initiation of a cascade of oral health complications. This includes but is not limited to dental erosion, dental caries, dry mouth, salivary gland edema, and periodontal disease. The complex relationship between disordered eating patterns and oral health highlights the need for a comprehensive and interdisciplinary approach to patient care. Dentists, working in collaboration with other healthcare professionals, play a vital role in addressing the intricate oral health challenges associated with eating disorders. Integrating dental considerations into the comprehensive management and treatment of EDs is crucial for enhancing overall well-being and promoting recovery in affected individuals (40-43).

The influence of self-induced vomiting and binge eating on dental health in people with eating disorders was examined in a research conducted by Johansson et al. 65 EDs patients and 17 patients who reported self-inflicted vomiting in the previous six months were included in the study. The findings indicated that it was typical to binge eat prior to self-induced vomiting and to brush one's teeth following vomiting. Only one of the 17 patients had told the dentist about their EDs, despite the fact that all of them thought vomiting may harm their teeth. According to the study, the dental team should be aware of the negative impacts that binge eating and vomiting have on ED patients' oral health as well as the value of honest communication between patients and medical professionals (41).

A previous study investigated the link between EDs and subjective health in Korean adolescents. It involved 46,146 participants who participated in the Korea Youth Risk Behavior Web-based Survey. The variables included eating behavior, body mass index (BMI), body image, subjective health, and oral health. Results showed that adolescents with an obese body image had a lower risk of EDs, and those with EDs had a higher risk of poor subjective oral health assessment (44).

In screening and treatment guidelines, EDs and oral health are frequently disregarded, while oral health guidance is frequently deficient. To better understand the relationship between EDs and oral health, including how EDs behaviors affect oral health and how oral health professionals can be trained to meet clinical care needs, Presskreischer and colleagues conducted a literature review. The effects of EDs on oral health, patient experiences with oral health care, and professional education and training in oral health were the main topics of a thorough scoping review that included 178 articles. According to the study's findings, the majority of studies on the connection between EDs and dental health concentrate on EDs behaviors; oral health professionals' knowledge and training have received less attention (45).

Although screening and education are recommended by national and international standards for dietitians, there is little proof that these activities are carried out in EDs populations, according to a study of dietitians' roles in improving oral health among patients with EDs. Dietitians in other contexts were often not making recommendations and had varying degrees of expertise on oral health risk factors, prevention, and treatment. To create a care approach that promotes oral health in people with EDs, more study is required (46).

4. Antipsychotic Medications and Dental Health

Antipsychotic drugs significantly impact dental health, attracting growing interest among patients with schizophrenia due to improved physical health, community integration, quality of life, and safer treatment. Psychiatric patients face high risk of dental diseases due to patient-related and service-related factors, including heavy smoking, neglecting oral hygiene, avoidant behavior, carbohydrate-rich diet, and psychotropic medications' impact on oral health (16,47-49).

Especially, schizophrenia patients are at a higher risk of dental caries due to various factors including sociodemographics, income, disease severity, adverse effects of drugs, and poor dental hygiene and smoking habits (13,50).

A previous study looked into the connection between the kind of antipsychotic medication being administered and dental conditions in hospitalized patients with schizophrenia. According to the researchers' hypothesis, patients receiving atypical antipsychotic treatment would experience better dental health than those receiving typical antipsychotic treatment alone or in combination with it. The findings demonstrated a significant increase in both the Missing and Filled teeth component score and the DMFT index scores for patients receiving standard antipsychotic treatment. On every metric, the combined treatment group was discovered to be halfway between the typical and atypical groups. The study recommends that dentists take into account the advantages of atypicals for oral health (49).

It was shown that 59.5% of 3610 newly diagnosed individuals with schizophrenia had dental caries that had been treated. Younger age, female sex, high income, two-year history of dental caries, and use of first-generation antipsychotics and antihypertensives represent new risk factors for dental caries. A protective factor was linked to hypersalivation from first-generation antipsychotics, but hyposalivation, an unfavorable consequence of these drugs, was linked to an increased incidence of treated caries (50).

Hyperprolactinemia and antipsychotic medications have a major impact on periodontal diseases, according to a study done on patients with schizophrenia. The study discovered a relationship between clinical attachment loss, bone mineral density, and serum prolactin levels. Periodontal disease is accelerated by all antipsychotics, although prolactin-inducing antipsychotics provide a greater risk. More extensive, long-term research is required to provide firm recommendations for the care of this patient population (51).

Psychotropic medications, such as mood stabilizers, anticonvulsants, antipsychotics, and antidepressants, are frequently prescribed to patients suffering from central nervous system dysfunctions. On the other hand, certain medications may have detrimental effects on dental health. Oral disorders such as rabbit syndrome, bruxism, orofacial dystonia, and oromandibular dyskinesia have been associated with the antagonistic action of antipsychotic medications on dopaminergic receptors. Oral infections, candidiasis, and dry mouth can all be brought on by anticholinergic and antiadrenergic medications. Psychostimulants may cause lesions in the mouth and nose, bruxism, gingival enlargements, xerostomia, and dental erosion. In order to take the necessary safety measures, dentists need to be aware of these dangers (47–49, 52). Mentally ill patients' poor oral health (33) is most likely caused by the

following factors: Social disengagement could lessen the need for assistance. Extracholinergic medications to treat extrapyramidal side effects. The factors that result in dry mouth could be the cause of. Patients who receive regular treatment have worse dental health than those in atypical areas. There were no variations in the carious tooth component between the groups, though. Lastly, the most common factors identified as risk factors for dental health are age and gender differences (53-56).

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