



## Review Article

## The bidirectional link between mental disorders and oral diseases: A review

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## Abstract

The interrelationship between oral health and systemic health is widely known concept. Similar is the case between mental disorders and oral diseases where a well appreciable yet complex interrelationship is observed. Various oral health problems are associated with mental health problems, with their interplay involving altered microbiome, translocated bacteria, and systemic inflammation, among others. Patients with mental disorders have greater risk factors for oral and dental disease compared to the general population. This could be attributed to the side effects of the medications, lack of self-care, inaccessible health services, a missing positive attitude towards healthcare providers, and lack of cooperation to dental treatments. A multidisciplinary approach is the need of the hour in caring for patients with mental disorders, and the importance of oral health should be stressed as an essential part of care for these patients. Future investigations should focus on deeper exploration of the biological relationships, to develop new directions for treatment. This review delivers an analysis of the link between mental disorders and the effect on dental health, as well as the significance of oral diseases as a probable etiological factor in mental disorders.

**Keywords:** Mental health, Multidisciplinary approach, Anxiety, Oral health, dental caries, Dental erosion, Periodontal disease, Bidirectional, Major depressive disorder.

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## 1. Introduction

In recent years, especially following the effects of the pandemic, the coronavirus disease (COVID-19) has brought added attention to the significance of mental health.<sup>1</sup> People with mental diseases are more likely to have poor dental health than people without mental illnesses.<sup>2</sup> Literature review revealed the relationship between common psychological problems, such as a diagnosis of depression, panic disorder, obsessive-compulsive disorder, post-traumatic stress disorder, generalized anxiety disorder, or a phobia, and poor oral health.<sup>3</sup> A strong correlation exists between tooth loss and prevalent mental health conditions; compared to controls, people with common psychological disorders had greater rates of decaying, missing, and filled tooth surfaces. Overall, bidirectional relationship is seen that patients with prevalent mental disorders have greater rates of dental decay and tooth

loss than the normal population. Research has demonstrated a connection between severe mental illness and eating disorders and poor oral health (such as chronic periodontitis and tooth erosion).<sup>4,5</sup> Previous studies have shown that the usage of oral health services and tooth loss was associated with anxiety and depression in people.<sup>6</sup> Anhedonia or lack of determination, feelings of worthlessness, and exhaustion are just a few of the depressed symptoms that can negatively impact individuals' dental hygiene maintenance activities. Numerous research showed the identical findings about dental behaviours, depression, and the treatment of oral conditions such periodontal disease.<sup>7-9</sup> These studies emphasize the possible cycle of relationships between dental and mental health (and vice versa) as well as the public health implications of mental health on oral health outcomes. Increased risk for tooth loss and dental decay can result in more frequent discomfort, social isolation, and low self-

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esteem, which can lower quality of life and may be linked to worse mental and general health.<sup>10</sup> This review delivers a current analysis of the bidirectional relationship between mental health conditions and dental health.

## 2. Affect of Mental Disorders on Oral Health

A person's behavioural or psychological patterns are indicative of a mental disorder, according to the DSM-5's criteria. About 3.8% of people worldwide suffer from the most common disorders, which are anxiety and depression. According to recent estimates, between 25 and 31 percent of adolescents worldwide suffer from anxiety and depression.<sup>11,12</sup> Globally, 792 million people received a mental health diagnosis in 2017, with women making up the majority of those diagnosed.<sup>13</sup> Depression, anxiety, bipolar illness, schizophrenia, dementia, and alcohol and drug use disorders are examples of common mental disorders. According to the American Psychiatric Association (1994), major depression is a syndrome that can be brought on by biological, social, or psychological reasons.<sup>5</sup> Examples of these include neurotransmitter deficiencies, divorce, financial difficulties, stressful events, and low self-esteem.

### 2.1. MDD (Major depressive disorder)

The association between periodontal disease and MDD may be explained by the fact that patients with MDD who exhibit elevated levels of circulating cytokines would also have elevated levels of cytokines in the GCF.

### 2.2. Anxiety and depression

Numerous studies demonstrate connections between mental health issues and oral health issues, including dental erosion in eating disorders like bulimia and anorexia, burning mouth syndrome in anxiety and depression, dental caries from excessive sugar consumption, an increased risk of periodontal disease from poor hygiene and excessive smoking, and an increased risk of dysfunction of the temporomandibular joint. People with bruxism, also referred to as teeth grinding, are more likely to experience anxiety or sadness.<sup>14-17,20</sup>

### 2.3. Mood disorders

According to reports, those with severe mental illnesses are 2.8 times more likely than the general population to become edentulous. 38% of patients with eating disorders have dental erosions; unlike the prevalent labial erosions brought on by extrinsic ingestion of acidic beverages, the palatal dental surfaces are typically impacted by self-induced vomiting.<sup>18,19</sup>

### 2.4. Antidepressants and psychotropics

These conditions are linked to xerostomia, dry mouth, and hyposalivation. Tricyclic antidepressants, for instance, may reduce a person's salivation rate in half. Dry mouth decreases denture retention, increases the risk of candida infections, and increases the risk of dental caries. According to recent meta-

analyses, there may be a substantial link between Alzheimer's disease and periodontitis.<sup>21-23</sup>

### 2.5. Bipolar disorder

Bipolar disorder has been linked to persistent inflammation. Taiwan conducted research on the connection between bipolar disorder and periodontitis between 2001 and 2012. Subjects with periodontitis were shown to be at higher risk for bipolar illness than subjects without the condition.<sup>24</sup>

### 2.6. Parkinson's disease

According to certain research, people with Parkinson's disease have a higher prevalence of periodontitis.<sup>25</sup>

### 2.7. Psychotropic medications

According to Dr. Jukka Meurman, a professor of oral and maxillofacial disorders at the University of Helsinki, dry mouth is a common adverse effect of medications, particularly antipsychotics. The emeritus professor examines the potential adverse effects of antipsychotic pharmaceuticals in one of his most recent peer-reviewed research, "Oral discomfort and health behaviour of patients with typical vs. atypical antipsychotic drugs." 46% of patients in the typical group and 5% in the atypical group in the study comparing patients on typical and atypical antipsychotic drugs reported chronic oral discomfort, which was mostly experienced as a burning sensation in the tongue and buccal mucosa. The prevalence of xerostomia was considerably higher in the usual antipsychotic group (66%) than in the atypical group (53%). Approximately 50% of the patients had seen a dentist during the previous 12 months, and women were more likely than males to seek professional assistance for oral complaints (28% vs. 17%).

## 3. The Impact of Poor Oral Health on Mental Health

There is a close relationship between mental and dental health. Approximately 50% of dental patients report feeling anxious about their appointments, which can occasionally result in dental phobia, a type of particular phobia.<sup>11</sup> Poor oral health can result in tooth loss and compromised speech and esthetics, adversely affecting self-esteem, socialization, occupational engagement - ultimately affecting the mental health of a person.<sup>26</sup> Oral cancer is one potential outcome of long-term dental neglect. Potentially malignant lesions are undetected when dental treatment is neglected. This is due to the fact that smoking, drinking alcohol, and maybe not practicing good oral hygiene are risk factors for both dental disease and oral cancer. In Spain, 7.81% of persons with oral health issues had depression (10.14% for women and 5.39% for men), with a significant decline in women's prevalence between 2017 and 2020. The State of Oral Health Equity in America 2021 survey found that respondents with poor mental health were almost four times more likely than those with good mental health to say that they felt self-conscious or embarrassed about their teeth and oral health issues (19%

versus 5%).<sup>27</sup> According to a different recent study done in Chennai, India, maintaining good dental health is crucial for leading a happy, healthy life, especially for young adults. The study, which looked at a sample of 84 working-age adults, discovered that dental health has a beneficial impact on general lifestyle and workplace wellbeing and significantly adds to psychological well-being. This suggests that improving dental health might lead to better mental health outcomes, emphasizing the necessity of incorporating dental care into more comprehensive health plans.

### 3.1. Dental erosion and caries

Tooth erosion affects 35% to 38% of persons with eating disorders. Dental erosion and caries finally lead to tooth loss this affects the normal chewing, talking and appearance of the person, leading to psychological disorders like generalised anxiety, panic disorders and post traumatic stress disorders. Gastric reflux can be a symptom of erosion brought on by excessive alcohol and tobacco usage.<sup>18</sup>

### 3.2. Gum diseases

Gingivitis and periodontitis are often associated with bad breath (halitosis) leading to social isolation, and low self-esteem, and reduced quality of life which in turn affects the mental health of the person and vice versa. Gum disease and decay are more common in those with severe mental diseases like dementia and schizophrenia because of bacterial infections.<sup>28</sup> The causes are identical to those of other mental illnesses. Among these are adverse effects of psychiatric drugs such as mood stabilizers, antipsychotics, and antidepressants. Periodontal disease is more common in people with serious mental problems. 99% of Italian mental patients in one research had gum disease.<sup>29</sup> According to a meta-analysis of four studies, the likelihood of having periodontal disease was about 50 times higher for individuals with serious mental illness (95% CI, 3.43 to 702; N ¼ 482).

### 3.3. Poor oral health

Poor oral health can lead to risk of several diseases in our body from diabetes to dementia.<sup>30</sup> Poor oral hygiene may even lead to systemic diseases like Alzheimer's diseases. Complete tooth loss can be caused by poor dental hygiene.<sup>31</sup> A study of partial and complete edentulism in adult Americans using data from the behavioural risk factor surveillance system revealed that those with depression had a 20–30% higher chance of losing all of their teeth.

### 3.4. Chronic oro-facial pain

Anxiety is more likely to occur in cases of acute orofacial pain, when the patient may experience psychological discomfort due to the increased pain intensity, or in cases of chronic orofacial pain, where psychological distress occurs due to the prolonged length of orofacial pain. Chronic orofacial pain affects their eating, speech and self-esteem. This acts as a stress which decreases serotonin levels leading to depression

and anxiety. Especially in older individuals are associated with high risk of dementia.

### 3.5. Partially/completely edentulous

Loss of more natural teeth and experiencing gum diseases can increase the risk of glaucoma, which is another threat to mental well-being. Tooth loss is the final stage of both untreated dental caries and periodontal disease, and it can affect the entire dental system (edentulousness).<sup>3</sup> According to a meta-analysis of 25 studies, the likelihood of losing all of one's teeth was 2.7 times higher for those with severe mental illness than for the general population.

### 3.6. Malocclusion

Individuals with mal-aligned teeth, supernumerary teeth or discolored/stained teeth, all of which affects their overall appearance thereby affecting their socialization, self-esteem, occupational engagement and ultimately affecting their mental health.

### 3.7. Impacted teeth

An impacted tooth due to lack of space to erupt may cause severe jaw pain, bad breath and inability to open the mouth, creating anxiety and stress in the person thus affecting the mental health.

### 3.8. Present era threat: effect of social media on oral health and mental health

Another way that mental health and dental health are related is through the influence of social media on mental health.<sup>32,33</sup> The usage of social media is especially common among teens aged 13 to 17.<sup>34</sup> Given that half of mental problems are created by the age of 14 and 75% by the age of 18, this group is concerning as research points to social media's detrimental effects on mental health.<sup>35</sup> According to a recent systematic review, teenage social media addiction, time spent on social media, activity, and investment were all associated with psychological distress, anxiety, and depression.<sup>36</sup> Dental professionals like sharing incidents on social media,<sup>37</sup> which may be entertaining to them. However, the impact of these posts has revealed that patients are more likely to seek out cosmetic smile modifications.<sup>38</sup> Indeed, young adults who are exposed to "ideal" facial photos blush more and are less satisfied with their faces.<sup>39</sup> Smile dissatisfaction and the belief that one needs dental work have an impact on mental health and can result in decreased social function and unhealthy coping mechanisms, including hiding teeth when laughing, eating, or interacting with others.<sup>40,41</sup> A extreme obsession with a self-identified physical imperfection is called body dysmorphic disorder. Since others fail to perceive the flaw, the level of engrossment is exacerbated.<sup>42</sup> Social media may induce people with body dysmorphic disorder to seek unnecessary and unrealistic dental care. Dental professionals must understand how social media plays a part in patients' treatment searches and carefully consider each patient's request using their clinical judgment.<sup>43</sup>

#### 4. Future Research

Further research is the need of the hour to understand the bidirectional mechanisms between oral diseases and mental disorders. Future transformative research is mandatory to help fight the burden of oral diseases and thereby inequalities faced by people with mental disorders. Designing and testing complex public health interventions such as integrating oral health schemes within young people mental health programs; health service interventions such as innovative custom designed referral pathways between mental health and dental services or oral cancer screening services or mental health training for dental professionals; and social care interventions such as fluoridation or tooth brushing schemes for mental health centers should be carried out in real-world settings and conducted by a interdisciplinary team, including, but not limited to, public health, psychiatry, psychology, special care dentistry, and primary care.<sup>44</sup>

#### 5. Conclusion

The relationship between poor oral health and mental health is bidirectional, experts highlight. On the one hand, poor oral hygiene might result from mental health issues. However, because poor dental health affects social interaction, self-esteem, and general well-being, it might worsen mental health conditions. The growing threat of mental illnesses necessitates national and international efforts in prevention, education, treatment, and awareness-raising. The connection between mental illnesses and dental problems is complex. A number of dental health issues are linked to mental health issues. Barriers to communication between dental and medical professionals may also prevent people with mental health issues from receiving the proper care. In order to provide complete treatment and support for people with mental and oral health problems, effective collaboration and communication are essential. Physical health needs, such dental care, are frequently overlooked in favour of psychiatric symptoms in many mental health treatments. There needs to be clarity regarding who is responsible for taking care of a patient's oral health, even within medical teams. Given the Bidirectional relationship between mental health and oral health, mental health practitioners should not overlook the significance of oral hygiene in their work. Simple actions like educating patients about the value of maintaining good oral hygiene, screening for oral health issues during regular clinical exams, and coordinating care with dental specialists can all help achieve this. In order to offer patients with mental health issues with comprehensive oral health treatment, mental health professionals—including nurses, doctors, dental hygienists, and dentists should work together. Oral health care should be acknowledged as a vital part of treatment for these patients, and a multidisciplinary approach is necessary. Oral hygienists can assist by providing information on topical fluoride treatments, mouthwashes, and artificial salivary solutions (to treat xerostomia). Frequent brushing, flossing, and antibacterial treatment can stop dental

health from declining, which can have a detrimental effect on mental health if ignored. A thorough oral hygiene routine is recommended for patients, especially those with serious mental diseases, in order to prevent problems such as gum disease, tooth decay, and dry mouth brought on by adverse drug reactions. Regular dental examinations and an emphasis on good oral hygiene not only enhance physical health but also have a major positive impact on mental well-being and general quality of life. Patients should be counselled to cut back on alcohol and tobacco usage, as well as their consumption of citrus fruits and acidic beverages. Chewing sugar-free gum helps to promote salivary flow, while avoiding caffeinated beverages lessens xerostomia. Drinking water frequently throughout the day also helps to reduce discomfort. Early dental referral, treatment of iatrogenic dry mouth, and assistance with oral hygiene should all be part of the interventions. Because mental health and dental health are bidirectional and treatment and preventive measure you to do manage one also benefits the other. Hence by making small changes in patient's day to day life we can have a lasting result.

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None.

#### 7. Conflict of Interest

None.

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