



"ORAL HEALTH AND MENTAL HEALTH: ASSESSING THE CORRELATION BETWEEN PSYCHIATRIC DISORDERS AND PERIODONTAL DISEASE"

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Abstract

Introduction

Mental health and oral health are interconnected, yet the relationship between psychiatric disorders and periodontal disease remains insufficiently explored. Psychiatric disorders such as depression, anxiety, schizophrenia, and bipolar disorder are prevalent and often linked to poor oral hygiene, which may lead to periodontal disease. This study aimed to assess the correlation between psychiatric disorders and periodontal disease among psychiatric patients.

Materials and Methods

This cross-sectional study included 80 participants (mean age 38.2 ± 9.5 years) diagnosed with psychiatric disorders, including depression, anxiety, schizophrenia, and bipolar disorder. Participants were assessed using standardized psychiatric scales and a clinical oral examination to evaluate periodontal disease, including clinical attachment level (CAL), Probing pocket depth (PPD), plaque index (PI), and bleeding on probing (BOP). The impact of psychotropic medications on periodontal health was also evaluated.

Results

The study found that 80% of participants had periodontal disease, with 45% presenting moderate and 35% severe disease. A significant positive correlation was found between psychiatric symptom severity and periodontal disease, with depression, anxiety, and schizophrenia linked to worse oral health outcomes ($r = 0.45$, $p < 0.001$ for CAL, $r = 0.41$, $p = 0.001$ for BOP). Additionally, 45% of participants reported xerostomia as a side effect of psychotropic medications, which was associated with severe periodontal disease.

Conclusion

This study demonstrates a strong association between psychiatric disorders and periodontal disease, with psychotropic medications exacerbating oral health issues. Integrated care addressing both mental and oral health is crucial for improving health outcomes in individuals with psychiatric conditions.

Keywords: Psychiatric disorders, periodontal disease, xerostomia, oral health, psychotropic medications, mental health.

Introduction

Oral health and mental health are interconnected aspects of overall well-being, yet the intricate relationship between these two domains has not been sufficiently explored in clinical and public health research. Mental health disorders, including anxiety, depression, schizophrenia, and bipolar

disorder, are widespread and contribute to a significant global burden of disease, with far-reaching effects on quality of life, productivity, and overall health. According to the World Health Organization, mental health conditions are among the leading causes of disability worldwide, affecting millions of individuals across all age groups and backgrounds. Psychiatric disorders are frequently associated with altered health behaviors, such as poor dietary habits, reduced physical activity, and neglect of self-care practices, including oral hygiene, which may exacerbate physical health conditions [1–3].

One of the most common and preventable diseases associated with neglect of oral health is periodontal disease, a chronic inflammatory disorder affecting the tissues supporting the teeth. Periodontal disease is a global public health concern, with studies suggesting a prevalence of over 45% among adults globally, making it a significant cause of tooth loss and functional impairment. The disease manifests as gingivitis, periodontitis, and, in advanced cases, tooth loss, with significant implications for nutrition, speech, and self-esteem. Furthermore, periodontal disease has been implicated in a range of systemic health issues, including cardiovascular disease, diabetes, respiratory conditions, and adverse pregnancy outcomes, reflecting its potential to impact overall health and well-being [4].

Emerging studies indicate a bidirectional relationship between mental health and oral health, particularly periodontal disease. On one hand, psychiatric conditions are frequently associated with poor oral hygiene practices, such as neglecting daily brushing, infrequent dental visits, and poor dietary habits. These behaviors, often exacerbated by cognitive and functional impairments associated with psychiatric disorders, increase the risk of periodontal disease. In addition, psychotropic medications such as antidepressants, antipsychotics, and mood stabilizers can lead to side effects like dry mouth, which further contributes to periodontal disease. On the other hand, the physical discomfort and social stigma associated with periodontal disease may exacerbate mental health symptoms, including depression, anxiety, and social isolation [1–3,5–7].

Despite the growing recognition of the relationship between psychiatric disorders and periodontal disease, gaps remain in understanding the underlying mechanisms that link these conditions. Studies vary in their scope, methodologies, populations, and outcomes, resulting in inconsistent conclusions regarding the strength and nature of this association. Some research suggests that depression and anxiety may be independent risk factors for the development of periodontal disease, while others propose that the relationship is influenced by socio-economic factors, medication use, or comorbid conditions such as smoking or substance abuse [6–9].

This study aims to investigate the correlation between psychiatric disorders and periodontal disease, focusing on both clinical and behavioral factors that contribute to this interrelationship.

Materials and Methods

This cross-sectional study was conducted at Department of Psychiatry, MMIMSR, Mullana. The study consisted of individuals diagnosed with various psychiatric disorders, including anxiety, depression, schizophrenia, and bipolar disorder.

Inclusion Criteria

- Adults aged >18 years
- A confirmed diagnosis of a psychiatric disorder according to DSM IV TR criteria
- Willingness to participate and provide informed consent

Exclusion Criteria

- History of systemic diseases (e.g., uncontrolled diabetes, autoimmune disorders) that could significantly interfere with periodontal health
- Cognitive impairments that prevented the ability to provide informed consent
- History of recent periodontal treatment or surgeries within the past 6 months
- Current use of medications that could impact oral health (e.g., corticosteroids) unrelated to the psychiatric condition

Sample Size Calculation

A total of 80 participants were recruited for the study, based on a sample size calculation to detect a moderate effect size (Cohen's $d = 0.5$) with a significance level of 0.05 and power of 80%. The final sample included 80 individuals with a diagnosed psychiatric condition, ensuring a robust analysis of the correlation between psychiatric disorders and periodontal disease.

Data Collection

1. **Psychiatric Assessment:** The severity of psychiatric symptoms was evaluated using standardized psychiatric rating scales for each condition:

- Hamilton Depression Rating Scale (HDRS) for depression
- Beck Anxiety Inventory (BAI) for anxiety
- Positive and Negative Syndrome Scale (PANSS) for schizophrenia
- Young Mania Rating Scale (YMRS) for bipolar disorder

These scales were administered by a trained psychiatrist to assess the severity of the participants' psychiatric symptoms at the time of the study.

2. **Oral Health Assessment:** A thorough clinical oral examination was performed by a trained periodontist. The following periodontal parameters were recorded:

- Plaque Index (PI): Assesses plaque accumulation on teeth
- Gingival Index (GI): Assesses the severity of gingival inflammation
- Probing pocket depth (PPD) was recorded from gingival margin to the base of the pocket using UNC-15 periodontal probe.
- Clinical Attachment Level (CAL) was recorded as the distance from the CEJ to base of the pocket using UNC-15 periodontal probe.
- Bleeding on Probing (BOP) assess gingival bleeding upon gentle probing of the gingiva with UNC-15 periodontal probe.

In addition, participants were surveyed about their oral hygiene practices, frequency of dental visits, and lifestyle factors such as tobacco use and alcohol consumption.

3. **Psychotropic Medication Assessment:** Participants' psychiatric medications were reviewed to assess any potential effects on oral health, especially xerostomia (dry mouth), which is a common side effect of many psychotropic drugs.

Outcome Measures

• **Primary Outcome:** The primary outcome of this study was the presence and severity of periodontal disease, evaluated using the clinical periodontal parameters (PI, GI, PPD, CAL, BOP).

• **Secondary Outcomes:**

- The correlation between the severity of psychiatric symptoms (as measured by HDRS, BAI, PANSS, YMRS) and periodontal disease severity
- The influence of psychiatric medications on oral health, particularly in relation to xerostomia and periodontal health
- Self-reported oral hygiene behaviors and frequency of dental care visits

Statistical Analysis

Data were analyzed using SPSS 16. Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to summarize participant demographics and clinical characteristics. The severity of periodontal disease was analyzed with respect to psychiatric severity using Pearson's correlation coefficient for normally distributed variables and Spearman's rank correlation for non-parametric variables. The influence of psychiatric medications on oral health outcomes was assessed using simple linear regression. A p-value of < 0.05 was considered statistically significant for all analyses.

Results

Demographic and Clinical Characteristics

A total of 80 participants (mean age 38.2 ± 9.5 years), diagnosed with various psychiatric disorders, were enrolled in the study. The study group consisted of 50% males ($n = 40$) and 50% females ($n = 40$). The participants were diagnosed with the following psychiatric disorders: depression ($n = 30$), anxiety ($n = 20$), schizophrenia ($n = 15$), and bipolar disorder ($n = 15$). The mean duration of the psychiatric disorder in the cohort was 6.2 ± 3.4 years. All participants were on psychotropic medication, including antidepressants ($n = 50$), antipsychotics ($n = 30$), and mood stabilizers ($n = 20$). (Table 1)

Periodontal Disease Prevalence and Severity

The overall prevalence of periodontal disease in the study cohort was 80%. The severity distribution of periodontal disease was as follows: 20% of participants had mild periodontal disease, 45% had moderate periodontal disease, and 35% had severe periodontal disease. The mean Clinical Attachment Level (CAL) was 3.2 ± 1.1 mm, indicating moderate to severe attachment loss across the sample. The mean Probing Pocket Depth (PPD) was 4.8 ± 2.3 mm, with a range from 2.5 mm to 7.5 mm. The Plaque Index (PI) and Gingival Index (GI) were also assessed. The mean PI was 1.7 ± 0.6 , indicating moderate plaque accumulation, while the mean GI was 2.1 ± 0.8 , indicating moderate gingival inflammation. A total of 60% of participants exhibited Bleeding on Probing (BOP), suggesting significant gingival inflammation. (Table 2)

Psychiatric Symptoms and Periodontal Disease Severity

Psychiatric symptom severity was found to be positively correlated with periodontal disease severity. The Hamilton Depression Rating Scale (HDRS) for depression showed a significant positive correlation with Clinical Attachment Loss (CAL) ($r = 0.45$, $p < 0.001$). Similarly, the Beck Anxiety Inventory (BAI) for anxiety correlated positively with Pocket Depth (PD) ($r = 0.38$, $p = 0.002$) and Bleeding on Probing (BOP) ($r = 0.41$, $p = 0.001$). The Positive and Negative Syndrome Scale (PANSS) for schizophrenia showed a significant correlation with Plaque Index (PI) ($r = 0.36$, $p = 0.004$). The Young Mania Rating Scale (YMRS) for bipolar disorder was positively correlated with Gingival Index (GI) ($r = 0.33$, $p = 0.007$), suggesting that increased manic symptoms were associated with worse gingival health. (Table 3)

Impact of Psychotropic Medications on Oral Health

Of the 80 participants, 45% reported experiencing xerostomia (dry mouth) as a side effect of psychotropic medication. Among these, 70% had severe periodontal disease. The use of antidepressants was significantly associated with higher Pocket Depth (PD) ($r = 0.42$, $p = 0.003$) and Bleeding on Probing (BOP) ($r = 0.39$, $p = 0.005$). Similarly, participants on antipsychotic medications had a higher prevalence of Plaque Index (PI) ($r = 0.37$, $p = 0.004$) and Gingival Index (GI) ($r = 0.33$, $p = 0.007$).

Oral Hygiene Practices and Dental Visits

Oral hygiene practices were suboptimal among the study participants. Only 30% of participants reported brushing their teeth twice a day, while 50% brushed once a day and 20% brushed less frequently. Only 35% of participants had visited a dentist in the last year, with the majority seeking care due to pain or discomfort rather than preventive care. Those who visited the dentist regularly (35%) had lower Plaque Index (PI) and Gingival Index (GI) scores, suggesting better oral health compared to those with infrequent dental visits.

Table 1: Demographic and Clinical Characteristics of the Study Participants

Characteristic	Value (Mean $\pm$ SD)
Age (years)	38.2 ± 9.5
Gender (Male/Female)	40 (50%)/40 (50%)
Duration of psychiatric disorder (years)	6.2 ± 3.4
Psychiatric diagnosis (%)	Depression: 30 (37.5%)
	Anxiety: 20 (25%)
	Schizophrenia: 15 (18.8%)
	Bipolar Disorder: 15 (18.8%)

Psychotropic medications (%)	Antidepressants: 50 (62.5%)
	Antipsychotics: 30 (37.5%)
	Mood Stabilizers: 20 (25%)

Table 2: Periodontal Disease Parameters

Parameter	Value (Mean $\pm$ SD)
Clinical Attachment Level (CAL) (mm)	3.2 $\pm$ 1.1
Probing Pocket Depth (PPD) (mm)	4.8 $\pm$ 2.3
Plaque Index (PI)	1.7 $\pm$ 0.6
Gingival Index (GI)	2.1 $\pm$ 0.8
Bleeding on Probing (BOP) (%)	60%

Table 3: Correlation between Psychiatric Symptom Severity and Periodontal Disease Parameters

Psychiatric Assessment Scale	Periodontal Disease Parameter	r-value (Coefficient)	p-value
Hamilton Depression Rating Scale (HDRS)	Clinical Attachment Loss (CAL)	0.45	< 0.001
Beck Anxiety Inventory (BAI)	Probing Pocket Depth (PPD)	0.38	0.002
Beck Anxiety Inventory (BAI)	Bleeding on Probing (BOP)	0.41	0.001
Positive and Negative Syndrome Scale (PANSS)	Plaque Index (PI)	0.36	0.004
Young Mania Rating Scale (YMRS)	Gingival Index (GI)	0.33	0.007

DISCUSSION

In the present study, 80 psychiatric patients were included with a mean age of 38.2 ± 9.5 years and equal gender distribution. Depression was the most common diagnosis (37.5%), followed by anxiety, schizophrenia, and bipolar disorder. Mean duration of illness was 6.2 ± 3.4 years, and all patients were on psychotropic medications. McCreadie et al. (1998) [10] reported schizophrenia patients with a mean age around 40 years and long illness duration (>10 years), similar to our cohort. Angelillo et al. (1995) [5] observed institutionalized psychiatric patients with long hospitalization (>8 years) and universal psychotropic use. Friedlander et al. (2002) [1] reported xerostomia in 40–70% of psychiatric patients on long-term psychotropic therapy, contributing to periodontal health deterioration. In the present study, periodontal disease prevalence was 80%, with 20% mild, 45% moderate, and 35% severe disease. Mean CAL was 3.2 ± 1.1 mm, PD was 4.8 ± 2.3 mm, and BOP was present in 60% of patients. McCreadie et al. (1998) [10] reported that about 70% of schizophrenia patients had severe periodontal disease. Thomas et al. (1996) [7] found moderate-to-severe periodontitis in 66% of psychiatric long-stay patients. Jones and Barber (1992) reported high plaque index values (2.1–2.5) and gingival bleeding in >55% patients. Angelillo et al. (1995) [5] observed that >60% required periodontal treatment. Kisely et al. (2005) [12] showed psychiatric patients have 2–3 times higher risk of severe periodontal disease and tooth loss. In the present study, HDRS correlated with CAL ($r = 0.45$), BAI with PD ($r = 0.38$) and BOP ($r = 0.41$), PANSS with PI ($r = 0.36$), and YMRS with GI ($r = 0.33$), showing strong association between psychiatric severity and periodontal deterioration. McCreadie et al. (1998) [10] reported DMFT scores >20 in 65% of schizophrenia patients with severe symptoms. Thomson et al. (1993) [11] showed progressive periodontal attachment loss (0.3–0.5 mm/year) in psychiatric populations. Lewis et al. (1996) [13] found higher gingival index (1.8–2.4) in severe psychiatric illness compared to stable patients (1.0–1.3). In the present study, xerostomia was seen in 45% of patients, and 70% of them had severe periodontal disease. Antidepressants and antipsychotics were significantly associated with worse PPD, PI, GI, and BOP. Friedlander et al. (2002) [1] reported xerostomia in 40–80% of psychotropic users. McCreadie et al. (1998) [10] found higher plaque scores (~ 2.3) in medicated patients. Angelillo et al. (1995) [5] reported 50–60% xerostomia-related oral deterioration in institutionalized patients.

In the present study, only 30% brushed twice daily and 35% had dental visits in the last year, mostly symptom-driven. Hede (1995) [9] reported only 25–30% regular brushing in psychiatric patients. Boyd et al. (1996) [8] found <40% preventive dental visits and >65% emergency-only attendance. Jones and Barber (1992) [14] observed mean PI >2.0 with high gingival bleeding. Kisely et al. (2005) [12] reported 2.5–3 times higher risk of severe untreated dental disease in psychiatric patients. The present study shows a high periodontal disease burden (80%) in psychiatric patients, strongly associated with poor oral hygiene, medication effects, and psychiatric severity. This is consistent with literature showing 60–70% prevalence of moderate-to-severe periodontal disease and significantly higher periodontal indices in psychiatric populations compared to general controls.

Limitations

Several limitations should be considered when interpreting the findings of this study. Firstly, the cross-sectional design limits the ability to establish causal relationships between psychiatric disorders and periodontal disease. Secondly, the self-reporting of oral hygiene practices and dental visits may introduce response bias, as participants might overestimate their oral health behaviors. Additionally, medication side effects, such as xerostomia, were reported by participants, but the exact role of each psychotropic medication in contributing to oral health issues was not individually assessed. Finally, the study was conducted in a single center, which may limit the generalizability of the findings to other populations.

Conclusion

This study reveals a significant link between psychiatric disorders and periodontal disease, with psychotropic medications contributing to worsened oral health. The high prevalence of periodontal disease (80%) highlights the need for integrated care addressing both mental and oral health. Improved access to dental care and oral hygiene practices is essential for this population. Further research should explore effective interventions to improve outcomes.

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