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Patient-reported oral health complications in bipolar disorder: focus on illness duration and functional impairments

Oral health in bipolar disorder

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Abstract

Aim: Although oral health problems are common in bipolar disorder, functional disorders such as temporomandibular dysfunction (TMD) and oropharyngeal dysphagia (OD), and their relationship with illness duration, have not been adequately studied. This study aimed to investigate the prevalence of oral health complications, TMD, and OD in bipolar patients based on self-reports and to assess their association with illness duration.

Methods: In this cross-sectional study, 70 bipolar patients aged 20–60 in remission were evaluated. The Oral Health Impact Profile-14, Numeric Pain Scale, Fonseca Anamnestic Questionnaire, Jaw Functional Limitation Scale-8, and Eating Assessment Tool were administered.

Results: Self-reported TMD was present in 64.3% and OD in 60% of patients. Illness duration showed a strong correlation with oral health quality (r = 0.858), TMD (r = 0.838), and OD (r = 0.865) scores (P < .001). Logistic regression revealed that each additional year of illness increased the risk of TMD 4.212 times (P = .020) and OD 2.433 times (P = .005).

Conclusion: Illness duration in bipolar disorder is a significant risk factor for oral health complications and functional disorders (TMD/OD). Routine screening for TMD and OD alongside dental check-ups may provide clinical benefits in this population.

Keywords

bipolar disorders, oral health, temporomandibular dysfunction, oropharyngeal dysphagia, illness duration

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Introduction

Oral health, an integral component of general well-being, has increasingly been linked to mental illnesses.[1] In psychiatric populations, oral health are often negatively associated with psychological factors, such as low self-esteem, lack of motivation, limited dental care literacy/Access, and treatment-related side effects.[2,3] Notably, bipolar disorder (BD) ranks among the world's ten most debilitating psychiatric conditions, with a global prevalence of 5%.[4] Pharmacotherapies for BD are heavily associated with detrimental orofacial reactions; for instance, lithium—the gold standard treatment—frequently associated with dry mouth, which accelerates tooth wear and dental caries due to reduced salivary lubrication.[5] Supporting this, a study from Türkiye demonstrated that 73.6% of bipolar patients on lithium therapy exhibited poor oral health, primarily characterized by advanced periodontal disease and caries.[6]

Temporomandibular disorders (TMD), a leading cause of chronic pain and disability, are closely linked to oral health issues.[7-10] While a recent meta-analysis showed an increased burden of decayed, missing, or filled teeth in patients with schizophrenia and BD, the evidence regarding whether these oral health problems are directly associated with TMD in this population remains unclear,1 though TMD symptoms appear more frequent in patients with schizophrenia.[11] Concurrently, oropharyngeal dysphagia (OD), a swallowing disorder involving bolus delivery to the upper esophagus,[12] is closely linked to factors like decreased saliva production and dental decline.[13] Crucially, unmanaged TMD can also impair chewing efficiency and reduce mandibular range of motion, thereby increasing the likelihood of OD.[14] Consequently, poor oral health, if left without intervention, may act as a common underlying factor associated with both TMD and OD.

Oral health problems are common in patients with BD due to treatment-related orofacial reactions and psychological factors. However, patient-reported functional impairments, particularly TMD and OD, remain understudied despite their implications for quality of life and treatment adherence. Since TMD and OD are linked to oral health and may become more pronounced with prolonged illness, a comprehensive evaluation of these conditions and their relationship with disease duration is warranted. Therefore, this study aims to evaluate the presence of TMD and OD alongside oral health problems in patients with BD and to determine the association of illness duration with these complications. To our knowledge, this is the first study to systematically investigate patient-reported oral health complications, functional impairments, and their association with illness duration in BD.

Materials and Methods

Study Design and Participants

This cross-sectional study was conducted between February and July 2023 (ClinicalTrial.gov: NCT06034769) in accordance with the Declaration of Helsinki. All participants provided written informed consent. The study initially screened individuals aged 18–65, diagnosed with Bipolar Disorder (BD) in the outpatient clinic units of Bakırköy Prof. Dr. Mazhar Osman Mental Health and Neurological Diseases Training and Research Hospital, who had used lithium regularly for at least one year. To ensure reliable scale assessments, inclusion required a minimum of three months in remission, defined as scoring ≤7 on both the Young Mania Rating Scale (YMRS) and the Hamilton Depression Rating Scale (HDRS).[15,16] Exclusion criteria comprised comorbid psychiatric disorders, alcohol/substance use disorders, neurological or musculoskeletal problems, facial paralysis, cancer, congenital anomalies, systemic diseases, or recent (<6 months) spinal, abdominal, or temporomandibular joint (TMJ) surgeries. Out of the initial pool, 14 individuals declined to participate, 17 were excluded due to high YMRS/HDRS scores, and 6 completed the scales incompletely. Consequently, the final sample consisted of 70 individuals.

Data Collection Tools

Descriptive Data Form

The researchers created a form to gather information from participants regarding their age, body mass index (BMI), gender, dry mouth sensation, taste loss, daily oral care habits, tooth loss, dental caries, duration of illness, and exclusion criteria.

Oral Health Impact Profile-14 (OHIP-14): This validated and reliable scale measures the impact of oral and dental health on quality of life (Cronbach Alpha value 0.94).[17] It consists of a total of 14 questions in physical pain, functional limitations, psychological discomfort, social disability, psychological disability, physical disability, and handicap dimensions, such as 'Has your sense of taste worsened?'. 'Do you have pain in your mouth that causes discomfort?'. Each question is scored from '0' (never) to '4' (always). The scale is rated from 0 to 56, with a higher score indicating a lower quality of life.

Numeric Pain Scale (NPS)

This simple and reliable method is often used in the clinic to measure pain intensity: the participant is asked to mark a number on a 10 cm scale from '0' (no pain) to '10' (unbearable pain) for the pain they feel in the TMJ region.[18]

Fonseca's Anamnestic Questionnaire (FAQ) is a reliable and valid tool for assessing TMJ disorder (Cronbach's Alpha value of 0.80).[19] The scale includes ten questions such as 'Do you have difficulty opening your mouth?', 'Have you ever heard any clicking sounds from the temporomandibular joint during chewing or mouth opening? Pain in the head, neck, and joints, pain during chewing, parafunctional habits, reduced joint movement, impaired occlusion and emotional distress. Scoring on the scale ranges from 0 to 100. The scale has a cut-off score, and a score of 25 or more indicates the presence of TMD.[20]

Jaw Functional Limitation Scale-8 (JFLS-8)

This scale assesses masticatory functioning during various jaw activities, such as 'chewing hard food' and 'chewing soft food that does not require chewing,' with eight questions. It has proven validity and reliability (Cronbach's Alpha value of 0.80). For each question, the respondent is asked to rate the level of limitation on a 10 cm horizontal line, with endpoints of '0-no limitation' and '10 severe limitation'. The individual's responses are averaged to calculate functional constraints. A higher score indicates reduced masticatory functioning on a scale ranging from 0 to 80.[21]

Eating Assessment Tool (EAT-10)

This assessment tool evaluates OD symptoms and severity. The validity and reliability of the scale have been proven (Cronbach's Alpha value 0.91).[22] A total of ten questions are asked, each scored between '0' (no problem) and '4' (severe problem), such as 'I make an excessive effort while swallowing solid foods' and 'I feel pain while swallowing.' The scoring of the scale ranges from 0 to 40. The scale has a cut-off score of 3 or more, indicating a swallowing problem.

Ethical Approval

This study was approved by the Bandırma Onyedi Eylül University Non-Interventional Research Ethics Committee (Date: 14.03.2023, Decision No: 2023-44).

Statistical Analysis

The IBM-SPSS 25.0 for macOS package program evaluated the participants' findings. Descriptive analyses were applied to the obtained data, and categorical variables were presented as frequency (n) and percentage (%). Parametric tests used mean ± standard deviation (SD), while non-parametric tests used median (with minimum and maximum values). Standard distribution conformity was assessed using the Kolmogorov-Smirnov Test. Spearman's rho correlation test was used to investigate the correlation between TMD-related and clinical data in all participants. After adjusting for age, gender, and BMI, multiple logistic regression analysis was used to determine whether illness duration was a statistically significant associated with TMD (FAA ≥25) and OD (EAT-10 ≥3) (Using the Enter method). Odds ratios (ORs), 95% confidence intervals for ORs, and Wald statistics for each independent variable were calculated. Statistical significance was determined as $P < .05$.

Based on the correlation between illness duration and FAQ score (r2=0.702), the post-hoc power of the study was calculated as 0.988.

Reporting Guidelines

The study was reported in accordance with STROBE guideline.

Results

Table 1 presents the clinical and demographic characteristics of the 70 bipolar patients (39 [55.7%] male, 31 [44.3%] female; mean age: 36.31 ± 11.13 years; illness duration: 11.42 ± 10.33 years). Oral health issues included tooth loss and dry mouth in 52 (74.28%), tooth decay in 33 (47.14%), and taste disorder in 28 (40%) participants. Regarding scale outcomes, temporomandibular disorders (TMD) were present in 45 (64.3%) individuals, while oral dyskinesia (OD) was detected in 42 (60%).

Table 2 analyses the correlations between the TMD-related scales, illness duration, and oral habits of all participants. It finds a statistically significant and strong correlation between illness duration and all scale scores ($P < .001$). A significant and strong correlation was also observed between the TMD-related scales and OHIP-14 ($P < .001$).

When analysing Table 3, including age, gender, and BMI, the impact of illness duration on self-reported TMD and OD presence was investigated using multivariate logistic regression analysis. The probability of having TMD increased statistically significantly by 4.212 times (95% CI:1.258-14.105) with each year's increase in illness duration ($P = .020$). The probability of having OD increased significantly 2.433 times (95% CI:1.314-4.506) with each year's increase in illness duration ($P = .005$). Age, female gender, and BMI were not statistically significant associated with TMD and OD in these individuals ($P > .05$).

Discussion

This study is one of the first to systematically examine the relationship between oral health complications and functional disorders (TMD/OD) based on patient reports and disease duration in BD. Our findings reveal the clinically significant prevalence of both oral health problems and functional disorders in bipolar patients, while also highlighting the progressive association of disease duration with these complications. These results expand upon existing literature, which has primarily focused on dental pathologies, contributing to a more comprehensive understanding of the implications of BD for oral health.

Table 1. Participants' Descriptive Clinical Characteristics and Average Scale Scores

	Mean ± SD
Age, y	36.31 ± 11.13
BMI, kg/m²	28.69 ± 7.29
Illness duration, y	11.42 ± 10.33
OHIP-14, score	16.17 ± 11.26
NPS, score	3.67 ± 2.56
JFLS-8, score	2.37 ± 16.93
FAQ, score	47.64 ± 29.92
EAT-10, score	9.48 ± 8.89
Variables	***n* (%)**
TMD	
Yes (FAQ25)	45 (64.3)
No (FAQ<25)	25 (35.7)
OD	
Yes (EAT-103)	42 (60)
No (EAT-10<3)	28 (40)
Gender	
Male	39 (55.7)
Female	31 (44.3)
Daily oral care	
Yes	50 (71.43)
No	20 (28.57)
Tooth decay	
Yes	33 (47.14)
No	37 (52.86)
Tooth loss	
Yes	52 (74.28)
No	18 (25.72)
Dry mouth	
Yes	52 (74.28)
No	18 (25.72)
Taste disorder	
Yes	28 (40)
No	42 (60)

Abbreviations; *SD, Standard deviation; BMI, Body mass index; OHIP-14, Oral Health Impact Profile-14; NPS, Numeric Pain Scale; JFLS-8, Jaw Functional Limitation Scale-8; FAQ, Fonseca Anamnestic Questionnaire; EAT-10, Eating Assessment Tool-10; TMD, Temporomandibular dysfunction; OD, Oropharyngeal dysphagia*

Prior research indicates that psychiatric patients exhibit a heightened susceptibility to dental caries and periodontal disease driven by increased carbohydrate consumption, dry mouth, and elevated Lactobacillus counts.[23] In BD, lithium therapy, the gold standard treatment, frequently induces dry mouth, which accelerates tooth wear and decay due to reduced salivary lubrication.[5] Consistently, 74.3% of lithium users in our sample reported dry mouth, and 40% experienced taste disorders. Furthermore, 47.14% presented with dental caries, 74.28% reported tooth loss, and 28.57% neglected daily oral care. Notably, these oral health complications were significantly associated with diminished quality of life, with a strong correlation observed between oral health quality and illness duration. These findings suggest that the cumulative burden of oral health problems over time may be progressively associated with long-term lithium use.

TMD may result in functional limitations that impact an individual's quality of life. These limitations include difficulty speaking, eating, and sleeping, as well as psychological distress such as anxiety

Table 2. Correlation of TMD-Related Data and Illness Duration of Patients

Variables (*N* = 70)	Statistic	OHIP-14	Illness duration, y
OHIP-14	*r*	—	0.858
	P value	—	< .001
NPS	*r*	0.843	0.785
	P value	< .001	<.001
JFLS-8	*r*	0.868	0.813
	P value	<.001	<.001
FAQ	*r*	0.869	0.838
	P value	<.001	<.001
EAT-10	*r*	0.883	0.865
	P value	<.001	<.001

Note; Results of Pearson correlation. Bold indicates P < .05.
Abbreviations; OHIP-14; Oral Health Impact Profile-14; NPS, Numeric Pain Scale; JFLS-8, Jaw Functional Limitation Scale-8; FAQ, Fonseca Anamnestic Questionnaire; EAT-10, Eating Assessment Tool-10

Table 3. Factors Associated With Self-Reported TMD and OD Status in Patients

Variables (*N* = 70)	OR	95% CI	Wald	*P* value	Model Summary
TMD					
Age, y	0.910	[0.729–1.136]	0.691	.406	-2 Log likelihood; 23.400 Nagelkerke R^2; 0.852 Hosmer Lemeshow; 0.723
Gender, female	0.301	[0.026–3.506]	0.919	.338	
BMI, kg/m²	1.076	[0.926–1.251]	0.926	.336	
Illness duration, y	4.212	[1.258–14.105]	5.436	.020	
OD					
Age, y	0.977	[0.798–1.195]	0.052	.820	-2 Log likelihood; 23.171 Nagelkerke R^2; 0.862 Hosmer Lemeshow; 0.942
Gender, female	0.264	[0.020–3.413]	1.041	.308	
BMI, kg/m²	0.977	[0.820–1.164]	0.066	.797	
Illness duration, y	2.433	[1.314–4.506]	7.993	.005	

Note; Results of Multivariate logistic regression analysis. Bold indicates P < .05.
Abbreviations; OR, Odds ratio; CI, Confidence interval; TMD, Temporomandibular dysfunction; OD, Oropharyngeal dysphagia

and depression.[24] Consequently, the management of TMD should encompass a range of intervention approaches. This methodology acknowledges that oral health management is essential in managing TMD. One study reported that oral health issues could be interrelated with TMD, and the quality of life concerning oral health was significantly compromised in TMD-involved individuals compared to those without TMD.[9] Our study found a high correlation between self-reported TMD and oral health quality in bipolar patients, and it was observed that an increase in adverse oral health problems were associated with a higher probability of having TMD. Consistent with the literature, we hypothesise that oral health issues could be associated with TMD.

One of the most critical symptoms of TMD is joint and/or muscle pain.[10] Our study found a high correlation between jaw pain, illness duration, and oral health quality. The increase in jaw pain, one of the main symptoms of TMD, by the duration of the illness may increase the possibility of TMD in these patients now or in the future. Indeed, we found self-reported TMD in 64.3% of bipolar patients in our study, and the possibility of having TMD increased 4.2 times with each year of increase in illness duration. This increase in the incidence of TMD may be associated with prolonged illness duration, oral health problems, and reduced chewing function. At the same time, our study found a high correlation between patients' limited chewing functionality, oral health quality, and illness duration. As a result, we can conclude that chewing functionality decreases with increasing illness duration in bipolar patients, and this may be accompanied by TMD and OD, as reported in the literature.

OD is linked to symptoms including difficulty in bolus collection at the back of the tongue, coughing during and after swallowing, frequent throat clearing, and complex and painful swallowing.[12] OD's global prevalence rate estimate is 43.8%.[25] According to a meta-analysis study on the prevalence of OD in patients with TMD, swallowing problems were found in 9.3% of patients with TMD, and it is assumed that these problems occur secondary to chewing disorders, especially in patients with chronic TMD.[14] In our study, self-reported OD was detected in 60% of bipolar patients. We found a high correlation between illness duration and swallowing problems, and it was observed that the probability of having swallowing problems increased 2.4 times with each one-year increase in illness duration. In addition, it has been reported in the literature that difficulties such as deterioration of dental status and decreased saliva production affect swallowing function and lead to an increased risk of OD.[13] Since it is known that the mentioned dental problems and dry mouth are also seen in bipolar patients, we think that bipolar patients are already have a higher probability of OD based on this information. Considering the many complications of swallowing, from malnutrition to pneumonia, we emphasise that OD in bipolar patients is remarkable.

This study indicates that self-reported TMD and OD symptoms are prevalent in bipolar patients, with illness duration potentially associated with oral health problems, TMD, and OD. Although these issues may not require urgent medical intervention, they can progressively impair physical and psychological quality of life. Beyond recent preventive dentistry recommendations, our

findings underscore the need for a holistic evaluation approach to raise awareness in this field. Supporting this view, the literature demonstrates that enhancing oral health awareness in bipolar patients improves medication compliance, diagnostic strategies, treatment plans, and psychological well-being.[4] Consequently, integrating a holistic assessment of TMD and OD into routine oral examinations is essential to optimize overall oral health.

Limitations

This study has several limitations. First, TMD and OD were assessed using subjective self-report scales rather than objective clinical examinations by dentists or otolaryngologists due to clinical workload and a lack of interdisciplinary collaboration, which may overestimate prevalence. Nevertheless, symptomatic patients were referred to specialists to fulfill ethical responsibilities, though their clinical outcomes were not followed up. Second, crucial factors influencing oral health, such as the number of bipolar episodes, overall disease burden, cognitive functions, and sociodemographic variables (e.g., education, occupation), were not analyzed. Third, the potential confounding implications of other psychotropics (antipsychotics and anticholinergics) were not controlled for, limiting our ability to isolate the specific association of lithium.

Despite these limitations, this study is among the first to demonstrate a strong correlation between bipolar disorder duration and TMD/OD. Furthermore, the self-report data directly reflect the patients' perceived symptom burden, underscoring the need for routine oral health screenings. Future longitudinal studies should incorporate objective clinical examinations through interdisciplinary collaboration, control for detailed psychopharmacological profiles, and account for bipolar clinical features.

Conclusion

In conclusion, oral health problems, TMD, and OD symptoms are highly prevalent in individuals with BD. Crucially, longer illness duration is strongly associated with poorer oral health quality and a higher prevalence of TMD and OD symptoms. Despite being based on self-reported data, these findings indicate that oral health assessments in bipolar patients must extend beyond dental issues alone. Integrating TMD and OD screenings into routine psychiatric follow-ups, particularly for patients with longer disease durations, is essential to enhance quality of life and enable early complication management. Future interdisciplinary research employing objective clinical measurements is required to validate these outcomes.

Declarations

Animal and Human Rights Statement

All procedures performed in this study were by the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent

Written informed consent was obtained from all participants.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest

The authors declare that there is no conflict of interest.

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None.

Author Contributions (CRediT Taxonomy)

Conceptualization: H.Ç.G., B.Ç.T.
Methodology: H.Ç.G., B.Ç.T.
Investigation: H.Ç.G., B.Ç.T.
Data Curation: B.Ç.T
Formal Analysis: H.Ç.G.
Writing – original draft preparation: H.Ç.G. Writing – review editing: H.Ç.G., B.Ç.T.
Supervision: H.Ç.G.

AI Usage Disclosure

No artificial intelligence tools were used in preparation of this manuscript.

Abbreviations

BD: Bipolar disorder
BMI: Body mass index
EAT-10: Eating assessment tool
FAQ: Fonseca's anamnestic questionnaire
HDRS: Hamilton depression rating scale
JFLS-8: Jaw functional limitation scale-8
NPS: Numeric pain scale
OD: Oropharyngeal dysphagia
OHIP-14: Oral health impact profile-14
TMD: Temporomandibular dysfunction
YMRS: Young mania rating scale

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