

# The Oral Manifestations of Psychiatric Disorders

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## Abstract

Background: Psychiatric disorders affect all aspects of patient's life, especially oral health for many reasons. Many studies showed that oral diseases are very common among psychiatric patients and that they are usually a result of bad oral hygiene in addition to other factors related to the pharmacokinetics of the psychotropic medications.

Our aim was to study: the prevalence of oral manifestations and the relation with the mental disorder using multi-variables (the type of psychiatric disorder, the duration of intaking psychotropic medications, number of psychotropic medications, demographic variables).

Materials and Methods: A cross-sectional study on patients with psychiatric disorder, data was collected from Psychiatry unit at AL-Mowasat Hospital - Damascus - Syria. Specially designed charts to collect data was established, and the chart included: personal and demographic data, psychiatric disorder, psychotropic medications, DMFT index chart, gingival index chart, periodontal index chart, TMJ disorders checklist. Mann-Whitney U test, Kruskal-Wallis test and spearman's correlation was made to find if there are any significant relations between the given variables.

Results: 46 patients (39.1% males, 60.9% females) were included of overall 70 examined patients. The majority of the patients were diagnosed with schizophrenia (73.9%), 39% of patients had bruxism, 21.7% of the sample were on one drug, 43.5% were on two drugs, 21.7% were on 3 drugs and 13% were on 4 or more drugs. the more medication taken the higher overall DMFT will be, patients taking 1 drug (DMFT=12.2), 2 drugs (DMFT= 13.4), 3 drugs (DMFT= 17.8) and 4 or more drugs (DMFT= 20.3). a significant relation between the number of taken medications and the overall DMFT was found ( $p= 0.036$ ), a significant positive correlation was found between the DMFT scores and the number of medication taken( $p=0.022$ ).

Conclusion: This study presents the general oral condition of the psychiatric patients. Those patients had higher rates of decayed, missed or filled teeth than general population, and higher rate of gingivitis (GI) and plaque (PI). A significant relation was found between total DMFT score and gender. Also, positive correlation was found between the total DMFT score and number of medications taken by the patients. No significant relation was found between total DMFT and medication type and duration of in taking psychotropic medications or type of mental disorder.

*Key Words: Oral health, Psychiatric disorders, DMFT index*

## Introduction

Psychological disorders are a highly prevalent health problem in most countries [1]. Although many psychological disorders are associated with comorbid physical illnesses such as cardiovascular diseases and cancer [2] the relation between oral health and mental illness was neglected despite the crucial importance of oral health to physical health [3] and the fact that improving dental health status enhances quality of life for the mentally ill patients [4]. Above all, oral symptoms may be the first or only manifestation of mental illness [5].

There are many risk factors for poor oral health in this population such as the poor quality of root canal treatment, coronal restoration and xerostomia [6]. xerostomia is considered the most common side effect of medications, many of which are antipsychotic and antidepressant drugs [7,8]. Xerostomia is linked with increased demineralization, decayed teeth number, and teeth loss as well [9].

Furthermore, hospitalized patients with long-term psychological disorders tend to have a higher prevalence of dental caries and lower number of dental consultations [10,11]. This may be caused by ignorance, fear, stigma, or negative attitudes by the professionals [12].

Psychiatric patients also tend to be more prone to develop oral diseases due to neglected oral hygiene because of their negative symptoms such as apathy leading to a decreased desire of performing oral hygiene habits and periodic dentists' visits, alongside with diminished cognitive abilities causing impairment to adhere to daily routines of oral hygiene [13-15].

There are contraindicated data about the association between Temporomandibular joint disorders (TMJDs) and psychiatric disorders; some medical literature indicates the existence of a relationship between TMJDs and mental illnesses, especially schizophrenia due to the prolonged consumption of antipsychotic drugs and conditions associated with the disorder itself [16], while others claim no strong relationship between these conditions [17].

## Aim of this Study

The aim of this study was to detect the prevalence of oral manifestations and TMJDs in patients with psychiatric disorders, and to study the correlation between the oral manifestations in patients with psychiatric disorders according to: demographic variables (gender), diagnosis of psychiatric disorder, the duration psychotropic medications intake, and the number of psychotropic medications.

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## Material and Methods

### Methods

This is a Cross-sectional study assessing patients with the psychiatric disorder. The mental disease was diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) criteria, and the oral manifestations were evaluated using: DMFT index, Löe-Silness gingival index, Ramfjord periodontal disease index, Helkimo index for physical examining the TMJ.

### Sample

Data were collected from patients with mental disorders in Psychiatry unit at AL-Mowasat Hospital - Damascus - Syria during April and May 2017 according to the inclusion criteria.

Oral examination was performed after receiving the patient's approval. In case the patient was unable to give informed consent due to his/her mental status, we requested his/her legal guardian's approval.

### Inclusion criteria

The sample included all Patients who were diagnosed with the following particular psychiatric disorders (psychosis, depression, bipolar) according to the DSM-5, and who were taking psychotropic medications for at least 3 months were included as well after approving oral examination.

### Exclusion criteria

Patients who were suffering from other systemic diseases known to cause oral manifestations, patients who were taking medications known to cause oral manifestations or xerostomia, and patients who underwent radiotherapy during the last 6 months were excluded from the sample.

### Examination procedure

After taking the patient's personal information and medical and dental history, Intraoral examination was performed, teeth were examined to calculate DMFT index [18]. Periodontal sacs were probed according to Ramfjord index teeth to assess

periodontal disease [19]. Gingival disease was assessed using Löe-Silness gingival index. Physical examination of the temporomandibular joint was performed according to HELKIMO's INDEX [20]. Diagnosis of psychiatric disorder was taken from each patient's medical profile which was written after proper physical examination and psychological evaluation by the hospital's psychiatrists according to DSM-5 protocols.

### Materials

Specially designed charts to collect the data including: personal and demographical data, psychiatric disorder, psychotropic medications (type, number, duration), DMFT index chart, gingival index chart, periodontal index chart, TMJ disorders checklist, periodontal prob (WHO prob), dental explorer, dental oral mirror, cotton roll, and personal protective equipment (PPE).

### Statistical analysis

SPSS v.22 was used to analyse the data. The significance level was set at  $P \leq 0.05$ . Mann-Whitney U test was performed for the analysis of mean values of the DMFT between the two genders. Kruskal- Wallis test was performed to evaluate the significant correlation between the stage of the psychiatric disease or the number of taken medications and the oral manifestation.

Oral health status was evaluated using DMFT index, and the relations were studied between the total DMFT and the gender, psychiatric disorder, diagnosis date, number of medication taken by the patients and the medication type.

## Results

The study sample included 46 out of 70 examined patients (65.7% included and 34.3% excluded). The majority of the included patients were diagnosed with schizophrenia (73.9%). The major number of excluded patients had other systematic diseases known to cause oral manifestations (58.3%). The included patients had a mean age of 36.5 years ranging from 20 years to 57 years. 39.1% of the patients were males, and 60.9% were females (*Table 1*).

*Table 1. Patients' selection criteria*

	Number	Percent	Category	Number	Percent
<b>Number of patients examined</b>	70	100%			
<b>Number of patients included</b>	46	65.70%	schizophrenia	34	73.90%
			Depression	8	17.40%
			bipolar	4	8.70%
<b>Number of patients excluded</b>	24	34.30%	Systematic disease	14	58.30%
			Alcohol	2	8.30%
			Drugs that cause oral manifestation	5	20.80%
			Others	3	12.60%

**Table 2.** Oral health status of study individuals

		percent	Pers_n*	brux*	Cheilo*	Onycho*	To_dmft*	D	M	F	PI	GI
smoking	Yes	43.40%	0.6	10%	30%	20%	19.4	8.3	7.3	3.8	2.2	1.8
	No	56.60%	1.3	60%	46%	23%	11.6	7.1	2.1	2.3	1.9	1.3
gender	Female	60.90%	1.2	57%	50%	21%	10.6	5.7	2.5	2.4	1.9	1.4
	male	39.10%	5.5	11%	20%	22%	21	11	7.3	3.8	2.2	1.7
diagnosis	schizo	73.90%	1.2	52%	41%	29%	15.7	7.6	4.7	3.3	2.1	1.5
	depression	17.40%	0.2	0%	25%	0%	11.5	6	2.8	2.8	1.8	1.5
	bipolar	8.70%	0.5	0	50%	50%	15.5	11	4.5	0.5	2.5	2
Diagnosis-date	New (3m -6m)**	8.60%	1.5	75%	50%	25%	9.25	6.5	1.8	1	2.3	1.5
	Medium (6m -6y)	17.30%	1	0	66%	33%	14	10	3.6	3	2	1.3
	Old (more than 6 y)	73.90%	0.875	37.50%	31.50%	18%	16.06	7.3	5.1	3.5	2	1.6
Medication number	1	21.70%	0.6	0	40%	20%	12.2	5.4	4	2.8	2.8	1.8
	2	43.50%	0.7	30%	30%	10%	13.4	8.3	2.8	2.3	1.9	1.6
	3	21.70%	1.8	80%	60%	40%	17.8	8.8	3.8	5.2	1.6	1.2
	4	13.10%	1.3	66%	33%	33%	20.3	7	11	2	2	1.6
Medication type	Schizo old ***	69.50%	1	37.50%	43%	18%	16	7.8	5.7	2.8	2.3	1.6
	Schizo new	56.50%	1.75	75%	50%	50%	11.5	7.3	1	3.3	1.5	1.3
	Old and new	39.10%	1.1	55%	33%	22%	17.6	7.6	7.1	2.8	2.5	1.8
	Ssris	30.40%	1.4	40%	57%	14%	12	5.1	5	1.8	2.1	1.5

\*pers\_n= number of oral bad habits - \*cheilo= cheilophagia - \* Onycho= onychophagia – \*to\_DMFT= total number of DMFT index; \*\*\* old generation of antipsychotic medication

Psychiatric patients had one of the following bad oral habit (bruxism, cheilophagia, or onychophagia) 39% of patients had bruxism and cheilophagia, 21% had onychophagia (Table 2).

21.7% of the patients took one psychotropic drug, 43.5% took two drugs, 21.7% took 3 drugs and 13% took 4 or more drugs.

39% of the patients were taking multi types of antipsychosis drugs (old and new generations). 69% were taking antipsychosis of old generation, while 56% were on antipsychosis of a new generation. 30% were on selective serotonin reuptake inhibitors (SSRIs) medications and 4.3% were taking Tricyclic antidepressants (TCAs) drugs. Both SSRIs and TCAs are antidepressant agents.

The duration of taking psychotropic medication was classified into 3 categories; New: indicating that the duration is between 3 -6 months, medium: indicating that the duration is between 6 months and 6 years, and long: indication that the duration is more than 6 years. Majority of the patients were diagnosed with a mental illness more than 6 years ago (73.9%) and were on medications since then.

Males had higher DMFT than females (males 21, females 10.6); males also had higher GI and PI indices than females.

Significant difference was found between gender according to DMFT scores ( $p= 0.007$ ) as males had higher DMFT (21) (Table 3). Average DMFT scores of schizophrenia patients were (15.7), depression patients (11.5), and bipolar patients (15.5) (Figure 1).

Patients who had been taking psychotropic medications for long duration had high DMFT (16), while those who took psychotropic medication for medium duration had an average DMFT (14), patients who recently started taking these medications (approximately 3 months) had (9.25) DMFT score.

Patients taking multiple psychotropic drugs tended to have higher DMFT scores, for patients taking 1 drug DMFT mean scores (12.2), while patients taking 2 drugs, 3 drugs, 4 or more drugs DMFT mean scores were (13.4), (17.8), and (20.3) respectively (Figure 2).

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scores (12.2), while patients taking 2 drugs, 3 drugs, 4 or more drugs DMFT mean scores were (13.4), (17.8), and (20.3) respectively (Figure 2).

DMFT scores despaired due to various protocols of treatment: patients taking multi drugs of different antipsychotics generations (old and new) had higher overall DMFT (17.6) than other groups (Table 2).

A significant association (using Kruskal-Wallis test) was found between the number of taken medications and the overall DMFT (p= 0.036). A positive correlation was found

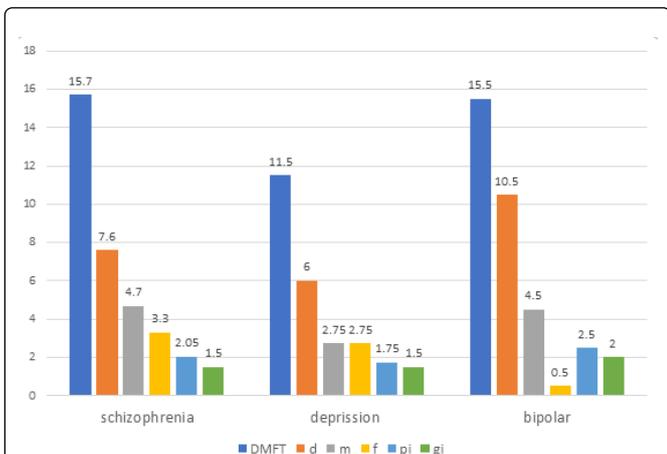
between the last two variables (using spearman's correlation test) (P= 0.022), but no significant relation was found between total DMFT and medication type (p=0.235), nor between total DMFT and diagnosis date (p=0.262), Also no significant relation was found between total DMFT and mental disorder (p=0.332) (Table 3).

Psychiatric patients had a high rate of TMJDs, (87%) of the patients had deviation during mouth opening, (78.3%) had a click sound when opening the mouth, (52.2%) had pain during chewing, other disorders were found with lower rates.

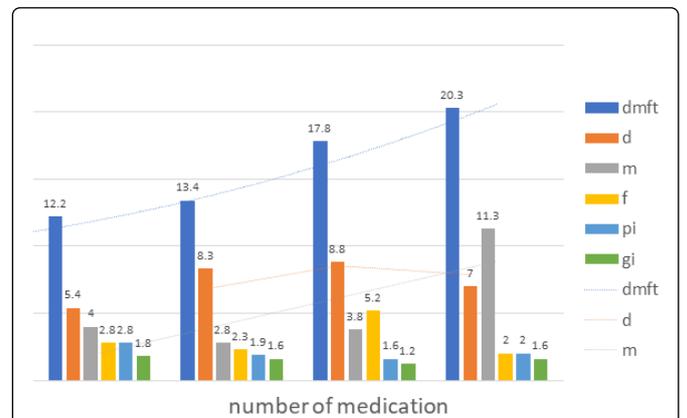
**Table 3.** Correlation between DMFT and various factors related to psychiatric patients

Factor		N (%)	Mean DMFT	Analysis method	P -value
Gender	Men	60.90%	10.6	independent samples Mann-Whitney U test	0.007 s
	Women	39.10%	21		
Diagnosis	schizo	73.90%	15.7	Kruskal -Wallis test	0.332 ns
	depression	17.40%	11.5		
	bipolar	8.70%	15.5		
Diagnosis-date	New (3m - 6 m)*	8.60%	9.25	Kruskal -Wallis test	0.262 ns
	Medium (6 m – 6 y)	17.30%	14		
	Old (more than 6 y)	73.90%	16.06		
Number of antipsychotic Medication	1	21.70%	12.2	Kruskal -Wallis test	0.036 s
	2	43.50%	13.4		
	3	21.70%	17.8	Spearman's correlation	0.022 s
	4	13.10%	20.3		
The type of antipsychotic Medication	Schizo old *	69.50%	16	Kruskal -Wallis test	0.235 ns
	Schizo new	56.50%	11.5		
	Both Old and new	39.10%	17.6		
	Ssris	30.40%	12		

\* old generation of antipsychotic medication ;S = significant; Ns = not significant



**Figure 1.** Mental illness distribution according to DMFT index



**Figure 2.** The number of medication in correlation with DMFT score

## Discussion

This study is the first to link oral manifestations and psychiatric disorders in Syria, the findings establish a corner stone in evaluating oral health in patients with special needs such as psychiatric disorders which are known to increase dramatically in times of war [21]. That is important because Psychiatric disorders affect all aspects of patient's life and there is a strong relation between oral health in patients with mental illness and the quality of life of those patients, and this emphasizes the importance of providing proper oral health care for them [4,22].

In our study, the scores of DMFT ranged between 4-29 with average number of DMFT 16, and psychiatric patients had worse gingival status than normal [23], a higher rate of dental plaque and a higher number of caries. A significant relation was found between gender and oral health status as males had higher rates compared to females with all indices (DMFT, PI, GI). A study in Caracas including 65 institutionalized patients found that psychiatric patients especially schizophrenics had a higher occurrence of plaque and gingivitis [22]. Another study which involved 81 psychiatric inpatients showed that those patients revealed significantly higher caries prevalence [24]. Several studies found no significant differences in caries rate between the healthy population and psychiatric patients [25,26]. Several previous studies evaluated the link between different demographic characteristics and DMFT index on mentally ill patients: one study took place in Japan on 523 schizophrenic inpatients using DMFT index found that age, smoking and low oral health and tooth brushing were significantly associated with a greater DMFT scores. On average patients in this study had 23 in DMFT index [10]. However, a study in 2016 showed no significant difference between the schizophrenic males' and females' DMFT scores [27]. While a meta-analysis in 2016 showed that patients suffering from depression and anxiety had higher rates of decayed teeth and teeth loss compared with general population, and schizophrenic patients had higher rates too, the disparity was less marked [28]. In other studies, in the same concern, there has been a significant relation between psychiatric disorders and some oral lesions like benign migratory glossitis [29].

There is a lake of documentation in the medical literature about the relation between DMFT scores and the variety of psychological disorders. No significant relation between the two variables was found in our study and so does a study from Nigeria on mentally ill patients [30].

The relation between the number of psychotropic medication and the rate of salivary flow was studied on 28 patients and the results indicated that the more psychotropic medications taken the higher rate of caries and bad oral health the patients will have [9], and that agrees with the significant relation between number of medications and the overall oral health in our study. Other study showed that mouth dryness which is a major contributor to oral health was significantly higher in schizophrenic patients who took multi-medications compared to patients who took only one medication, the same study indicated a strong association between mental illness and periodontal diseases [11], which strongly agrees with our study.

A study on the effect of TCAs and SSRIs on the level of salivary flow showed that both medications groups had an effect on the overall salivary flow, TCAs caused a significant reduction in flow while SSRIs caused no significant change [8.] These findings correspond with our results as no significant relation was found between the type of medication and the DMFT index, and no unusual high DMFT scores was found among patients taking SSRIs, while patients taking TCAs exhibited a slightly higher DMFT score.

This study focused on the general symptoms affecting psychiatric patients. Almost 87% of the patients had problems involving difficulty in mouth opening and click sound when moving the joint. Other study indicated that prevalence of TMJDs symptoms is not common among psychiatric patients, TMJDs and psychiatric disorders seem to have common comorbidity but no clear correlation was found between them [17]. While in a large cohort study the results showed that depression is a risk factor for TMJDs, and women are at higher risk to develop these disorders than men [31]. Another study compared the prevalence of acute and chronic TMJDs in psychiatric patients and the results showed higher rates of chronic TMJDs among psychiatric patients in comparison with normal population [32]. In this matter, the use of more effective method in detecting TMJDs such as Lucid Flowchart of the Diagnostic Criteria for Temporomandibular Joint Disorders would be more beneficial in future researches [33].

## Conclusion

This study presents the general oral condition of the psychiatric patients. Those patients had higher rates of decayed, missed of filled teeth than the general population, and a higher rate of gingivitis (GI) and plaque (PI). A significant relation was found between the total number of DMFT and gender and the number of medication taken by the patients. However, no significant relation was found between total DMFT and medication type or diagnosis date or type of mental disorder. Also, high rate of TMJDs was found and the deviation during mouth opening had the highest rates, however, no significant relation was found.

## Recommendations

More attention should be given to the oral health of psychiatric patients. A protocol for routine oral examinations and treatment should be established and applied for psychiatric patients during their follow up visits. Preventive oral treatment should be achieved before starting psychotropic medications courses. Patients should be informed of the possible consequences for the medications treatment.

## Limitations

No previous dental records were found for the patients included in the sample; therefore no comparison between the oral health before and after the onset psychiatric disorder has been made.

Further research concerning the oral health of the psychiatric patients should be made with larger sample size in order to generalize the result; therefore the findings of this research can't be generalized because of the small sample size

of this research, which was due to the limited number of functioning medical psychiatric facilities.

### Declaration of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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