Oral Health Status among Psychiatric Patients in Riyadh, Saudi Arabia

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ABSTRACT

Objective: *The purpose of this study is to describe the oral health status among psychiatric patients as compared to psychologically normal controls.*
Method: *A convenience sample of 100 patients who regularly attended a psychiatric clinic in King Saud University, King Khalid Hospital, Riyadh, Saudi Arabia, was selected as the study group. The control group consisted of 84 age- and gender-matched volunteers. All controls were screened using the General Health Questionnaire (GHQ-28) and five persons were excluded based on this. All the participants were interviewed and a comprehensive review questionnaire designed for this survey was completed, then they were examined. The examination involved an extra-oral examination as well as examination of teeth and soft tissues using the decayed, missing, filled teeth (DMFT) index, the Silness and Löe plaque index and the bleeding index.*
Results: *The study group had more tenderness in the masticatory muscles, especially the temporalis muscle. Temporomandbular joint findings showed no significant differences between groups. Decayed, missing, filled teeth index, plaque and bleeding indices were higher among the study group. The incidence of scalloped tongue was significantly higher among psychiatric patients.*
Conclusion: *Oral health status is worse among psychiatric patients, who are more likely to develop some oral conditions, such as temporomandibular disorder and dental caries. It is necessary for both dental and mental healthcare providers to be aware of patients' needs and preventive measures to be instituted for them.*

Keywords: Psychiatric disorders, oral health, outpatients

Estado de la Salud Oral entre los Pacientes Psiquiátricos en Riyadh, Arabia Saudita

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RESUMEN

Objetivo: *El propósito de este estudio es describir el estado de la salud oral entre los pacientes psiquiátricos en comparación con controles psicológicamente normales.*
Método: *Una muestra conveniente de 100 pacientes que asistían regularmente a una clínica psiquiátrica en King Saud University, King Khalid Hospital, Riyadh, Saudi Arabia, fueron seleccionados como grupo de estudio. El grupo control consistió en 84 voluntarios apareados por sexo y edad. Todos los controles tuvieron que pasar el tamiz del Cuestionario General de Salud (GHQ-28) y cinco personas fueron excluidas sobre esa base. Todos los participantes fueron entrevistados, y respondieron a un cuestionario integral de revisión diseñado para este estudio, tras lo cual fueron examinados. El examen conllevó un examen extraoral así como un examen de los dientes y los tejidos blandos, incluyendo el índice DMFT, el índice de placa de Silness y Löe, y el índice de sangramiento.*
Resultados: *El grupo de estudio tenía más sensibilidad en los músculos masticatorios, especialmente el músculo temporal. Los hallazgos de la articulación temporomandbular no mostraron ninguna diferencia significativa entre los grupos. Los índices de DMFT, placa, y sangramiento fueron más altos entre el grupo del estudio. La incidencia de lengua festoneada fue significativamente más alta entre los pacientes psiquiátricos.*

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Conclusión: *El estado de salud oral es peor entre los pacientes psiquiátricos, que muestran una mayor tendencia a desarrollar algunas condiciones orales tales como trastorno temporomandibular y caries dentales. Es necesario que tanto los profesionales de la salud dental como los de la salud mental tengan conciencia de las necesidades de sus pacientes y de las medidas preventivas que es necesario instituir para ellos.*

Palabras claves: Trastornos psiquiátricos, salud oral, pacientes ambulatorios

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INTRODUCTION

The term psychosomatic disease was introduced to describe those diseases where the psyche (including mental frameworks and attitudes) influences bodily process (1). Physiological responses, such as the flight-or-fight response, involve a physiological process, and if these responses are prolonged, they are likely to cause damage (1). Further, an acute reaction to stress involves a multi-faceted pattern of biological responses that involve the hypothalamic-pituitary-adrenal axis (2−4).

Several diseases have been linked to emotional disorders, including periodontal diseases, lichen planus, burning mouth syndrome and temporomandibular joint (TMJ) disorders (5−10). The exact mechanism by which such disorders result in changes in physical health is not yet clear. However, it may be due to disturbances in overall homeostasis (1).

Inconsistency in the oral findings of various studies can be explained by the fact that stimulated target organs vary based on the availability of coping responses and avoidance strategies (1, 6). In addition, most of the reviewed literature has addressed one oral disease entity such as temporomandibular disorder (TMD) and periodontal diseases (1, 7−9). However, the appearance of psychosomatic diseases may vary from one individual to another depending on the psychosomatic formulations of diseases (1).

Individuals with neurological disorders may display oral diseases as part of their initial presentation (psychosomatic diseases) or may have them as a result of their neurological disease or its treatment.

Managing different patients' personalities and behaviours requires a good understanding and awareness of the interactions between patients' psychological and physiological health and the outcomes associated with psychiatric disorders. Although researchers have shown variable associations between physical and mental health, psychological/psychiatric disease is thought to play a role in physical health but is not the sole aetiological factor.

Due in part to the dramatic increase in the stressors associated with life in the 20th and 21st centuries, there has been an increase in psychological and psychiatric disorders. Both psychological and psychiatric disorders are associated with a decline in oral health (1−3). Because of this, it is important that healthcare providers, specifically dentists, recognize common oral diseases among psychiatric patient populations. Dentists' awareness of patients who have special needs may improve diagnostic strategies and treatment plans relating to complex or persistent dental complaints. However, the data concerning the most prevalent oral findings encountered in the psychiatric patient population are limited. The aim of this study was to assess the oral health status of chronic psychiatric outpatients in Riyadh, Saudi Arabia, as compared to mentally normal controls.

SUBJECTS AND METHODS

One hundred adult patients who regularly attended the adult psychiatry clinic at King Saud University, King Khalid Hospital, Riyadh, Saudi Arabia, were included in the study. A comprehensive questionnaire was designed for this survey. The questionnaire consisted of the following: demographic data, diagnosis, type of treatment and drugs received, duration of the disease, oral habits and extra- and intra-oral examination findings.

The control group consisted of 89 age- and gender-matched Saudi volunteers. All participants in the control group were screened for psychiatric disorders using the General Health Questionnaire (GHQ-28) [11]. Five participants were excluded after the GHQ-28 screening, leaving 84 controls. All participants in this investigation were chosen as a sample of convenience, which excluded patients with comorbid medical conditions and those who used drugs other than psychotropic drugs. All patients were interviewed and were given a full explanation of the study's objectives, significance and methods. The examination involved an extra- and intraoral examination (both hard and soft tissues). The Silness and Löe plaque index, bleeding index and decayed, missing and filled teeth (DMFT) index were used in this study. All patients and controls were examined by the same examiner.

Statistical calculations were performed using SPSS, version 19.0 for Windows (SPSS Inc, Chicago, IL, USA). Results are reported as mean ± standard deviation frequencies. For comparison analyses, *t*-test was used for parametric data, and χ was used for non-parametric data. Significance level was set at $p < 0.05$.

The study protocol satisfied all ethical requirements relating to the use of human subjects, and ethical approval was obtained from the Center for Dental Research Ethics Committee.

RESULTS

There were 100 individuals in the study group and 84 in the control group. The distributions of age, gender and educational level are presented in Table 1. There were no significant differences between the study and control groups with regard to age, gender or level of education. Tobacco usage was more common among the study group (20%) compared to the control group (6%; $p = 0.006$). Data about psychiatric disease (psychiatric diagnosis, duration of mental illness and current medications) and dental health were not significant.

Table 1: Sociodemographic data of the two groups

Variable		Group		Total
		Control n (%)	Study n (%)	n (%)
Age	20−30	48 (26.1)	47 (25.5)	95 (51.6)
	31−40	20 (10.9)	34 (18.5)	54 (29.3)
	41−50	16 (8.7)	19 (10.3)	35 (19.0)
Gender	Female	59 (32.1)	59 (32.1)	118 (64.1)
	Male	25 (13.6)	41 (22.3)	66 (35.9)
Educational level	None	6 (3.3)	12 (6.5)	18 (9.8)
	High school	42 (22.8)	52 (28.3)	94 (51.1)
	University	36 (19.6)	36 (19.6)	72 (39.1)

Extraoral examination demonstrated significantly more masticatory muscle tenderness among the study group ($p = 0.000$). The prevalence of masticatory muscle tenderness was 37% and 22.6% for the study and control groups, respectively. Temporalis muscle tenderness was the most common finding with prevalence of 50% in the study group and 44.1% among the controls. Clicking and crepitation in the TMJ was found in 25% of the study group and in 27.4% of controls. Only one person in the study group had limitations in mouth opening. Clenching and bruxism were the most common oral habits among both groups and were seen in 34.5% of the controls and 27% of the study group. Nail, lip and cheek biting were observed in 8.3% of controls, with one individual having two oral habits (bruxism and lip biting) and only two having both of these habits in the study group (Table 2).

Tooth-related findings (*eg* attrition, staining, fractures and cracks of the teeth) were observed more in the study group (48%) compared to 34.5% of the control group at $p = 0.002$ (Table 3). Attrition was the most common hard tissue finding among both groups and was observed in 33.3% (28/84) of the controls and 31% of the study group.

Tooth staining was significantly higher ($p < 0.000$) in the study group, occurring in 21% of the study group and 4.8% of the controls (Table 3).

Other teeth findings (*eg* fracture and crack) were found in 3.6% of the controls and only one of the study subjects.

With regard to missing teeth, 45.2% of the controls and 34% of the study group did not have any missing teeth. Thirty-six (42.9%) of the controls and 48 (48%) of the study group had 1–5 missing teeth. Twelve per cent of the study group and 9.5% of the controls had 6–10 missing teeth. Six per cent of the study group and 2.4% of the controls had more than 10 teeth missing. Of the controls, 26.2% had no carious teeth, compared to 6% of the study group. Forty-nine per cent of the study group and 59.5% of the controls had 1–5 carious teeth. Twenty-nine per cent of the study group and 11.9% of the controls had 6–10 carious teeth. Only 2.4% (2) of the controls and 16% of the study group had more than 10 carious teeth. Thirty-one per cent of the study group and 19% of the controls had no filled teeth. Thirty-eight per cent of the study group and 29.8 % of the controls had 1–5 filled teeth. Fifteen per cent of the study group and 36.9% of the controls had 6–10 filled teeth. Sixteen per cent of the study group and 14.3% of the controls had more than 10 filled

Table 2: Temporomandibular joint findings of both groups

Variable	Group	Mean (± SD)	*t*	*p*-value (two-tailed)
TMJ clicking/crepitation	Control	0.27 (± 0.449)	0.364	
	Study	0.25 (± 0.435)		
Masticatory muscle tenderness	Control	0.23 (± 0.421)	-2.126	0.000
	Study	0.37 (± 0.485)		
Temporalis muscle tenderness	Control	0.4 (± 0.499)	-0.803	
	Study	0.5 (± 0.503)		
Limitation in oral opening	Control	0.00 (± 0.000)	-0.916	
	Study	0.01 (± 0.100)		
Bruxism/clenching	Control	0.35 (± 0.478)	1.102	0.032
	Study	0.27 (± 0.446)		
Nail, lip or cheek biting	Control	0.08 (± 0.278)	1.995	0.000
	Study	0.02 (± 0.141)		

The mean difference is significant at the 0.05 level.

Table 3: Tooth findings and indices in both groups

Variable	Group	Mean (± SD)	*t*	*p*-value (two-tailed)
Plaque index	Control	1.1 (± 0.51152)	-1.480	
	Study	2.7 (± 9.85123)		
Bleeding index	Control	45.2 (± 20.37417)	-11.196	0.000
	Study	79.01 (± 20.35585)		
Carious teeth	Control	2.95 (± 2.879)	-5.619	0.000
	Study	6.21 (± 4.873)		
Missing teeth	Control	1.95 (± 2.837)	-1.967	0.013
	Study	3.14 (± 4.885)		
Filled teeth	Control	5.58 (± 4.587)	1.575	
	Study	4.46 (± 5.008)		
Mean DMFT	Control	10.48		
	Study	13.81		
Tooth staining	Control	0.05 (± 0.214)	-3.277	0.000
	Study	0.21 (± 0.409)		
Other tooth findings (*eg* fracture and crack)	Control	0.04 (± 0.187)	1.190	0.017
	Study	0.01 (± 0.100)		

The mean difference is significant at the 0.05 level.
DMFT = decayed, missing, filled teeth.

teeth. Both missing and carious teeth were significantly higher among the study group [$p = 0.013$ and $p = 0$ .000, respectively] (Table 3).

The mean DMFT was slightly higher in the study group, 13.81 compared to the control group, 10.48. Plaque and bleeding indices were higher among the study group (Table 3).

Soft tissue findings were more frequent in the study group (65%) in comparison with the control group [47.6%] ($p = 0.006$). Scalloped tongue was the most common soft tissue finding among both groups. It was present in 40% of the study group and 42.9% of controls. Other findings that were detected only in the study group: lichen planus (3 patients), aphthous/traumatic ulcers (14 patients) and oral pigmentation (8 patients). Specific disease diagnosis and type of treatment did not display any significance.

Patients with neurotic disorders and psychotic disorders had some significant oral diseases (Table 4). Scalloped tongue was significantly higher among those with neurotic disorders ($p = 0.006$), while bleeding index was higher among those with psychotic disorders ($p = 0.037$). Limitation of mouth opening was significant among those who had less than one year duration of disease ($p = 0.010$).

DISCUSSION

The interaction of mental health and physical well-being is well established. However, few studies have investigated the prevalence of oral diseases among psychiatric patients. Most previous reports have focussed on psychological symptoms, primarily stress, as either an aetiological or predisposing factor to illness.

This investigation revealed higher masticatory muscle tenderness among individuals with psychiatric illness. Association between stress and muscle tenderness has been reported by Davis *et al* (12). The issue of whether psychological factors play a role in the generation or aggravation of masticatory muscle tenderness needs to be investigated further.

The overall increase in signs of TMD, in this study, may highlight the importance of poor mental health as an initiating or predisposing factor for TMD. On the other hand, TMD patients were found to have increased rates of depression, somatization, psychosocial dysfunction, drug abuse and impaired general health (13−17). This investigation may also signify the importance of taking the history and evaluating the psychological status of those patients.

As observed by Manfredini *et al*, the results displayed a correlation between psychiatric illness and TMD (13). Likewise, parafunctional habits were not associated with TMD incidence among these patients. Thus, oral habits findings may not predict the absence or presence of the disease among such patients. This is because patient attention to other health problems, somatization and psychiatrist intervention with non-pharmacologic and pharmacologic therapies, is more than to parafunctional habits.

High tooth staining scores among psychiatric patients may be attributed to high tobacco usage. Tobacco use is

Table 4: Significant findings among patients with the diagnosis of neurotic disorder and psychotic disorder

Variable		Mean (± SD)	*t*	Sig (two-tailed)
Psychotic disorders				
Soft tissue finding	No	0.79 (± 0.410)	2.240	0.028
	Yes	0.58 (± 0.497)		
Scalloped tongue	No	0.59 (± 0.500)	2.778	0.007
	Yes	0.31 (± 0.465)		
Bleeding index	No	73.15 (± 20.34)	-2.120	0.037
	Yes	82.12 (± 19.81)		
Neurotic Disorders				
Missing teeth	No	4.07 (± 5.88)	2.302	0.024
	Yes	2.00 (± 2.88)		
Stains	No	0.29 (± 0.46)	2.159	0.033
	Yes	0.12 (± 0.32)		
Soft tissue finding	No	0.55 (± 0.50)	-2.582	0.011
	Yes	0.79 (± 0.41)		
Scalloped tongue	No	0.29 (± 0.46)	-2.819	0.006
	Yes	0.56 (± 0.50)		
Bleeding index	No	83.11 (± 18.87)	2.322	0.022
	Yes	73.74 (± 21.18)		

reported to cause staining of teeth restorations and dentures (18, 19).

The results of the present study demonstrated increased prevalence of caries, plaque and bleeding among psychiatric patients. Oral neglect due to poor mental health could explain these findings (20). The interaction of immune responses and psychological factors as a suppressor or activator of the immune system should be investigated.

The DMFT score was higher among the study group, which is consistent with the findings of other similar studies (21−26). In our study, the number of decayed and missing teeth was higher among the study group, while the filled teeth were higher among the control group. In contrast, Lewis *et al* found a similar level of decayed teeth, fewer filled teeth and more missing teeth between mental health patients and controls (26). This may also confirm that oral health neglect among psychiatric populations is higher (20). This is also supported by the high prevalence of plaque and bleeding indices among the psychiatric patients in this study, which may predispose them to or aggravate dental problems. In agreement with our data, other studies have shown associations between psychological diseases and caries and other periodontal diseases (7−9, 27). Improving dental access and care for such patients can improve the DMFT score of long-term psychiatric inpatients (28).

In conclusion, the neglect of oral health is higher among psychiatric patients than healthy controls. Psychological factors play a role in the overall status of the patient; thus, it is essential for dentists to identify these patients and to recognize their medical needs.

Psychiatric patients are more liable to develop some oral conditions, such as TMD and dental caries. Performing research highlighting the common oral diseases among these patients may clinically aid in identifying their oral complaints, assist in management and treatment plan.

Dental care providers should be aware of the role that psychological problems play in the origin and maintenance of oral complaints. They should be able to elicit a careful history of any general or psychiatric diseases and medications and to use these data to construct and implement a good treatment plan and oral hygiene protocol.

Further studies are needed to validate these preliminary results and to evaluate the interactions, roles and outcomes of psychiatric illness and physical disease.

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