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Oral and dental health in hospitalized psychiatric patients: a cross-sectional and comparative study in Kerman, Iran

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Abstract

Introduction: The purpose of this study was to assess oral and dental health of hospitalized psychiatric patients.

Methods: This cross-sectional study which included 193 psychiatric patients was conducted in two psychiatric hospitals (Shahid Beheshti and Bahman) in Kerman, Iran. According to the duration of the hospital stay, patients were categorized into two groups of acute and chronic. The oral and dental health of the patients was assessed using Decay, Missing, Filling Teeth (DMF-T) index and Oral Assessment Guide for Psychiatric Care (OAG-PC). High score for these two scales indicated a worse oral and dental health.

Results: Mean (±SD) DMFT and OAG-PC scores of the patients were 19.74 (±7.88) and 20.77, respectively. Univariate analysis showed that patients in chronic group had higher OAG-PC ($P=0.014$), but the difference of DMF-T scores was not statistically significant between the two groups ($P=0.57$). After controlling confounding variables, the differences of the DMF-T and OAG-PC scores were not statistically significant between the two groups (P values of 0.88 and 0.64, respectively).

Conclusion: Oral and dental health in the studied psychiatric patients was poor. It is vital to improve the oral and dental health status of psychiatric patients.

Keywords: Dental Health, DMF-T, OAG-PC, Oral Health, Psychiatric Patients

Introduction

Oral cavity is an important part of the body. A functional oral cavity is necessary for nutrition, emotional expression and speech (1). Studies have assessed the oral and dental health and their status in general populations and sub-population groups including psychiatric patients in developed countries. According to the results of these studies, several factors including the large quantities of saliva-reducing medications being taken, poor diet and the apathetic nature of many psychiatric patients could result in poor oral health in patients with psychiatric disorders (2). Medications commonly used for psychiatric patients cause xerostomia (dry mouth) which subsequently can lead to speech difficulties, acute staphylococcal parotitis, increase in oral moniliasis, increased risk of gingivitis, periodontitis and stomatitis, difficulties in swallowing and food remnants adherent to the teeth, resulting in rampant caries (1,3). Oral hygiene is therefore of utmost importance for these patients. There must be more coordinated attempts between the social and dental care sectors to adequately serve the needs of this disadvantaged group (4). Little information is available on the oral and dental health status and treatment needs of special groups in developing countries such as Iran; in particular, one area of community dentistry that is of great importance, and yet suffers from neglect, is the oral health of psychiatric patients (5). Iran is a large country located in the Middle East. Kerman province, which is located in central and southeast of Iran, is the largest province in Iran covering 11% of the total area and approximately 3%-4% of total population (with 2.5 to 3 million people) of the country.

Oral and dental status of the hospitalized psychiatric patients has not been assessed in Kerman. Thus, this research is the first study that has been conducted in Iran.

The purpose of the present study was to describe the oral and dental health status in a group of hospitalized psychiatric patients using Decay, Missing, Filling Teeth (DMFT) and Oral Assessment Guide for Psychiatric Care (OAG-PC) scales in 2009-2010, Kerman, Iran.

Methods

Participants

This study was conducted on all patients in two psychiatric hospitals (Shahid Beheshti and Bahman) affiliated with Kerman University of Medical Sciences (KUMS) over a one year period. The study population included 245 patients admitted to two psychiatric hospitals in Kerman city, Iran. Out of these subjects, nearly 79 (40.9%) were diagnosed with schizophrenia, 53 (27.5%) with bipolar disorder, 14 (7.3%) with schizoaffective disorder and 10 (5.2%) with a combination of bipolar disorder and mental retardation. Patients were designated as acute or chronic, related to their length of hospitalization. Acute patients were generally of short-stay (duration of hospitalization less than 2 years) and chronic patients were generally of long-stay (duration of hospitalization more than 2 years) (1). Permission to include the patients in the study was received from the attending physicians of the psychiatric unit and from the chief nurse in the wards. This study was approved by the ethics committee of Kerman University of Medical Sciences (Code: K-85/43).

Oral and dental health assessment

Patients were checked for the status of their teeth and oral mucosa. We used DMFT index and OAG-PC scale in order to describe their health status.

Oral Assessment Guide for Psychiatric Care scale

Validity and reliability of this tool has been evaluated in some studies (6-8) and has been considered as an appropriate instrument for clinical practice (9,10) (Kappa coefficient range of 58% to 91%).

To determine the oral health status, we used OAG-PC scale. The oral assessment guide (OAG) is consisted of 12 categories including 1) odor from mouth, 2) lips, 3) salvia, 4) tongue, 5) mucous membranes, 6) gums, 7) teeth or dentures (or denture bearing area), 8) calculus on teeth, 9) appearance of teeth, 10) looseness of teeth, 11) number of teeth in the upper jaw and 12) number of teeth in the lower jaw. Three levels of descriptors received a score of (1 = normal findings); (2 = minor changes in the oral condition without serious compromise of either epithelial integrity or systemic function), and (3 = a definite compromise of either mucosal integrity or systemic function). Concerning categories 11 and 12, a score of 1 implies a full set of teeth, that is 14-16 teeth in each jaw, a score of 2 means 10-13 teeth in each jaw, and a score of 3 indicates 0-9 teeth in each jaw. Each category of the assessment guide forms a subscale and the total scores for all 12 categories range between 12 and 36. The lower the score, the better oral health status (1).

Decayed, Missing, Filled Teeth index

To determine the dental health status, we used DMF-T index. DMF-T index, which represents overall dental status, was calculated for each patient. The index has three components: 1) D (decayed): number of carious teeth, 2) M (missing): number of missing teeth, and 3) F (filled): number of restored teeth. The total (DMF-T) score is the sum of D + M + F. The Persian version of DMF-T index has acceptable reliability and validity (The reliability coefficient of this test in Iran was 0. 91) (11).

Data collection

Oral examination was performed in the psychiatric wards by using an electric torch, a tongue depressor, a dental mirror and number 5 explorers. If it was necessary, the teeth were dried with gauze squares. The patients were examined while sitting in an ordinary chair in front of a window under natural light. Bedridden elderly patients were examined in the wards. All data were initially entered into data collection forms. Using the patients' records, the examining dentist recorded demographic information including age, sex, marital status and date of first admission to the hospital to determine the length of hospital stay. A record was made of the medical condition and the psychiatric diagnosis of each subject as recorded in the hospital notes by the patients' attending physicians. A list of current medications being taken was obtained from the patients' charts. Furthermore, the participants were questioned about smoking and snuff-taking habits. Regarding tooth brushing and last dental visit, many of the patients in long-term care had great difficulties giving relevant answers. Therefore, these types of questions were excluded from the analysis.

Statistical analysis

Data were expressed as means and standard deviations (±SD). To compare two groups of acute and chronic patients, student *t* test and univariate linear regression were used. To adjust the effects of some confounding variables such as age and sex, multivariate linear regression analysis was used (in this study, we only reported *P* values concerning the regression analyses and β coefficients were not reported). Pearson correlations (r) were also applied. Categorical variables were compared by the chi square test. All statistical analyses were done by the SPSS for windows (version 15; SPSS Inc., Chicago, IL, USA). *P* value <0.05 was considered statistically significant.

Results

Basic characteristics

From 245 admitted patients, 193 subjects (response rate of 78.7%) took part in the study. The remaining patients were not permitted by both their physicians and/or him/her to participate in the study. The number of acute and chronic patients was 101 and 92 subjects, respectively. The mean age of the study population was 39.33 years. Male to female ratio was 2.22. Out of 193 patients, 116 (60%) were smokers and 105 (54%) were single. Mean age, sex ratio,

marital status and smoking status were significantly different between two groups of acute and chronic patients. Mean age, male sex and smoking in chronic patients were significantly higher than acute patients (*P* values were <0.001, 0.04 and <0.001, respectively). In contrast, the percentage of married patients was higher in acute patients compared to chronic ones ($P<0.001$) (Table 1).

Oral and dental heath results in total population

In total population, mean (±SD) decay, missing, filling, DMF-T index and OAG-PC scale scores were 9.05 (±4.1), 11.39 (±7.8), 4.22 (±3.8), 19.74 (±7.8), and 20.77 (±5.1), respectively. The mean DMF-T score of smokers was significantly higher than non-smoker patients (21.53±7.69 vs. 16.33±7.08, respectively; $P<0.001$). There was poor oral hygiene in addition to more calculus, malodor, and dry mouth among the group of cigarette smokers. In both groups, OAG-PC scale score had a direct relation with the patient's age ($r=0.19$, $P<0.0001$). The mean value for OAG-PC score was significantly higher in smokers than in non-smokers ($P<0.01$). The mean value for OAG-PC scale score was higher in males than in females ($P<0.01$). Oral hygiene showed a worse condition in male patients.

Oral and dental health results in two groups

Table 2 shows the scores according to two groups of acute and chronic patients. According to univariate analyses, missing, decay and DMF-T scores were significantly higher in chronic patients than acute patients ($P<0.01$), but after adjusting for age, sex, marital status, and smoking as confounding factors, only missing teeth score was significantly higher ($P=0.042$). The differences of OAG-PC scale scores were not significant in two univariate and multivariate analyses between the two groups (Table 2).

Table 3 presents oral health status according to OAG-PC scale categories in two groups of the study. There were statistically significant differences ($P<0.05$) between two groups for six of the OAG-PC scale categories including saliva, mucous membrane, calculus on teeth, appearance of teeth, number of the teeth in the upper jaw, and number of the teeth in the lower jaw (Table 3). Except mucous membrane, other categories scales were significantly higher in chronic group than that in acute group ($P<0.05$). Finally, we compared the mean OAG-PC scale and DMF-T index scores according to main psychiatric diagnosis. These scores were significantly higher in psychotic (including schizophrenia and schizoaffective disorder) patients than neurotic (bipolar disorder and others) patients (*P* values were 0.003 and 0.026, respectively).

Discussion

This investigation presents the first study that assesses the dental and oral health status of institutionalized psychiatric patients in Kerman, Iran. This study also identified the differences of oral and dental health status between patients in short-term and long-term (chronic patients) psychiatric care. The results of our study showed a poor oral and dental heath in psychiatric patients of Kerman province. Also, a poor association was found between a worse dental health and long term stay in hospital among psychiatric patients, but in term of oral health, type of hospitalization (i.e., long-term vs. short-term stay) was not a significant indicator. It has been suggested that the caries experience of people with psychiatric illness would be higher than that of the general population because of their poor diet, poor oral hygiene and the xerogenic nature of the medications prescribed for them (2). In this study, the

Table 1. Demographic and basic characteristics data of the patients in the acute and chronic hospitalized psychiatric patients

Variables	Acute patients (n = 101)	Chronic patients (n = 92)	*P* value
Age, mean (±SD)	36.0 (±12.7)	42.7 (±11.5)	<0.001
Sex (male/female)	63/38	70/22	0.040
Marital status, married (%)	48.0	22.2	<0.001
Smokers (%)	48.0	75.6	<0.001
Snuff taker (%)	1.0	5.6	0.103

Table 2. Mean and standard deviation of number of decayed, missing, filled teeth, DMF-T index and OAG-PC scale scores in acute and chronic hospitalized psychiatric patients

Variables	Acute patients (n = 101)	Chronic patients (n = 92)	*P* value[a]	*P* value[b]
Decayed teeth	7.78±3.77[c]	10.23±5.04	0.001	0.090
Missing teeth	8.09±9.5	14.7±9.7	< 0.001	0.042
Filled teeth	3.64±2.9	4.8±6.9	0.625	0.553
DMFT	18.34±8.18	21.19±7.33	0.014	0.883
OAG-PC scores	19.38±4.86	19.79±5.10	0.575	0.649

[a] based on *t* test and univariate linear regression.
[b] based on multivariate linear regression, after adjusted for age, sex, marital status and smoking.
[c] Values are presented as mean ± SD.

Table 3. Comparison of mean scores of each OAG-PC scale category between acute and chronic hospitalized psychiatric patients

Category	Acute patients (n=101)	Chronic patient (n=92)	*P* values
1. Mouth odor	1.59	1.66	0.633
2. Lips	1.17	1.32	0.130
3. Saliva	1.21	1.42	0.003
4. Tongue	1.51	1.66	0.434
5. Mucous membrane	1.51	1.10	0.000
6. Gums	1.69	1.60	0.425
7. Teeth or dentures	1.89	1.95	0.398
8. Calculus on teeth	1.99	2.36	0.002
9. Appearance of teeth	2.20	2.47	0.011
10. Looseness of teeth	1.38	1.32	0.420
11. Number of teeth in upper jaw	1.89	2.40	0.000
12. Number of teeth in lower jaw	2.02	2.40	0.002

mean DMFT was 19.74 ± 7.88. In a study by Lewis et al, the mean DMFT of psychiatric patients was similar to our results (19.1 ± 7.9) (2). However, in another study this figure was lower (7.92) (12). Our study showed that 81.3% of all psychiatric patients and 100% of the dentate patients exhibited untreated decays. In two separate studies, 75.5% of all psychiatric patients and 75.3% of dentate psychiatric patients exhibited caries (13,14). Vigild et al also found that 55% of the psychiatric patients had untreated decay (15). Some authors recorded that 12% of psychiatric patients did not have any caries (12,16), while we did not encounter with any caries-free patient. Another investigation identified oral health of the psychiatric patients as generally very poor compared to the general population. Out of 65 long-stay patients in a psychiatric hospital, only one patient did not have calculus, decayed or fractured teeth (17). Our study showed that patients in long-term psychiatric care did not score significant differences on the total OAG-PC compared with those in short-term psychiatric care. This result is against the results of a study in Sweden (1). There were significantly higher values of calculus, poor tooth appearance and lower mean number of teeth in both upper and lower jaw in long-term hospital stay group. One explanation for these results is higher mean age of patients in long-term care. It may also be explained by the number of smokers in this group, which was greater than that of short-term hospital stay patients. It should be noticed that patients in short-term care are usually able to take care of their own affairs such as making an appointment with a dentist, albeit patients in long-term care are usually more dependent on caregivers, helping them with their activities of daily living.

The mean DMF-T index and OAG-PC scale scores were significantly higher in the smokers group. In another study, smokers had worse oral health status than non-smokers (1). We found poor oral hygiene in addition to more calculus and malodor among cigarette smokers. In a study by Nalcaci and Baran, smoking was found to be associated with self-reported halitosis (18). Some authors showed that the production of volatile sulphur compounds in diseased periodontal pockets is significantly increased in smokers (19). There was a higher OAG-PC scale score among male patients, which can be the result of better attention of females to their oral hygiene. The smaller number of smokers among the female group and lower mean age of females were also the reasons of lower OAG-PC scale score. This research showed that the prevalence of edentulous patients (14.5%) was considerably lower compared with other studies (2,15,20). One explanation is that routine access to dentistry facilities is not available for many of our psychiatric patients. So decayed teeth remain in their mouth until toothache or other dental problems force them to seek dental treatment. Angelillo et al also found that the prevalence of edentulous psychiatric patients was low (11.1%) in Italy (4). Medications were not included in this analysis due to the complex pattern of medications prescribed to the participants. Almost all of the participants had received or were receiving potentially xerogenic medications. In integrative literature reviews and meta-analyses about oral hygiene care for residents with dementia, the use of oral assessment screening tools by staff and efficacious preventive oral hygiene care strategies/products were supported (21). Kilbourne et al studied the oral health in Veterans Affairs patients diagnosed with serious mental illness and suggested that greater efforts are needed to improve oral health outcomes among these patients by facilitating access to dental care and addressing mutable factors such as smoking and medication side effects (22). Studies have demonstrated that, with the application of sound principles of oral hygiene, nursing care can prevent or lessen the incidence of serious medical complications. However, oral health care is given a low priority among nurses and other psychiatric staff (1).

Conclusion

The results of the present study indicate that it is vital to improve the oral health status and thereby the quality of life of psychiatric patients, especially those in long-term

care. Chronic mental illness and its treatment carry inherent risks for significant oral diseases (23). In order to perform oral health care, qualification of all psychiatric staff should be improved.

Clinical significance

This study emphasizes the need that those responsible for institutionalized psychiatric patients, including psychiatrists, physicians, nurses and auxiliary staff, must be prepared to assist this special group with regard to their dental health status.

Ethical issues

Oral or written informed consent was obtained from the patients and because of their status if it was not possible to take it, authors of the study tried to obtain the informed consent from one of the first-degree relatives of the patients.

Authors' contributions

GCh and MRZ designed the study. GCh, AGh, and ShA collected the data. MSh did the data analysis. GCh, MSh, MRZ, ShA, AGh, and AZA prepared the manuscript. RS contributed to the manuscript draft and revision. All of the authors contributed to the final revision of the manuscript and approved it.

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