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Prevalence of dental caries in hospitalized patients with schizophrenia

Prevalencija karijesa kod bolesnika hospitalizovanih zbog shizofrenije

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Abstract

Background/Aim. It is considered that over 450 million people worldwide suffer from some form of mental disorder. Previous studies in other countries have shown that schizophrenia is among the most frequent. Oral health is significant for general health and should not be separated from mental health. Studies in other countries have shown an increased incidence of carious and extracted teeth, and less incidence of filled teeth in this group of psychiatric patients. The aim of this study was to establish condition of the existing teeth, to determine the prevalence of caries and to consider possible risk factors that contribute to the current oral health status of hospitalized patients with schizophrenia. **Methods.** The study comprised 190 patients with schizophrenia, hospitalized at the Clinic for Psychiatric Disorders "Dr. Laza Lazarević" in Belgrade, and 190 mentally healthy patients at the Clinic for Periodontology and Oral Medicine, Faculty of Dental Medicine in Belgrade. The decayed, missing, filled (DMF) index, sociodemographic and economic characteristics were registered in both groups, as well as characteristics of the primary disease of hospitalized patients with schizophrenia. **Results.** The value of DMF index (representing the sum of carious, extracted and filled teeth), in the hospitalized patients with schizophrenia was 18.57 ± 7.07 and 12.47 ± 5.64 in the healthy group ($p = 0.000$). The structure of the DMF index in the study group showed that caries and extracted teeth dominated with 88.1%; in the control group, filled teeth dominated with 55.6%, which was a statistically significant difference for all the three observed variables. **Conclusion.** Hospitalized patients with schizophrenia had twice as many caries and extracted teeth, and five time less filled teeth than healthy people. The patient's age and taking antiparkinsonics were established as predictors of the increased DMF index in hospitalized patients with schizophrenia.

Key words:
schizophrenia; hospitals, psychiatric; dental caries; prevalence; dmf index; oral hygiene.

Apstrakt

Uvod/Cilj. Smatra se da preko 450 miliona ljudi širom sveta pati od nekog oblika mentalnog poremećaja, a istraživanja sprovedena u drugim zemljama pokazala su da je shizofrenija među najzastupljenijima. Oralno zdravlje zauzima značajno mesto u celokupnom zdravlju čoveka i ne treba ga razdvajati od mentalnog zdravlja. Istraživanja sprovedena u drugim zemljama pokazala su povećanu zastupljenost karijesnih i izvađenih zuba, a manje plombiranih zuba kod ove grupe psihijatrijskih bolesnika. Cilj studije bio je da se istraži stanje prisutnih zuba, odredi prevalencija karijesa i ispitaju mogući faktori rizika koji doprinose postojećem stanju oralnog zdravlja kod bolesnika hospitalizovanih zbog shizofrenije. **Metode.** U istraživanju je učestvovalo 190 bolesnika sa shizofrenijom, hospitalizovanih na Klinici za psihijatrijske bolesti „Dr Laza Lazarević" u Beogradu i 190 mentalno zdravih ispitanika, pacijenata Klinike za parodontologiju i oralnu medicinu Stomatološkog fakulteta u Beogradu. Ispitanicima obe grupe registrovane su vrednosti KEP indeksa, sociodemografske i ekonomske karakteristike, a bolesnicima hospitalizovanim zbog shizofrenije i karakteristike primarne bolesti. **Rezultati.** Vrednost KEP indeksa kod bolesnika hospitalizovanih zbog shizofrenije iznosila je $18,57 \pm 7,07$, a kod zdravih osoba $12,47 \pm 5,64$ ($p = 0,000$). U strukturi indeksa koji pokazuje zbir brojeva karioznih, ekstrahovanih i plombiranih zuba (KEP) kod bolesnika sa shizofrenijom, dominirali su karijesni i ekstrahovani zubi – 88,1%, a u kontrolnoj grupi plombirani zubi – 55,6%, što je bila statistički značajna razlika za sve tri posmatrane varijable. **Zaključak.** Bolesnici hospitalizovani zbog shizofrenije imali su dvostruko više karijesnih i izvađenih zuba, a pet puta manje plombiranih zuba od zdravih osoba. Kao prediktori povećanog KEP indeksa kod bolesnika hospitalizovanih zbog shizofrenije ustanovljeni su starost ispitanika i korišćenje antiparkinsonika.

Ključne reči:
shizofrenija; bolnice, psihijatrijske; zub, karijes; prevalenca; dmf indeks; higijena, oralna.

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Introduction

Mental health is an integral part of general health [1]. It is considered that over 450 million people worldwide suffer from some form of mental disorder [2]. Previous studies in other countries have shown that schizophrenia is among the most frequent [3–7].

Schizophrenia is a chronic mental disorder characterized with remissions and exacerbations, which leads to social and occupational disability of patients. It is a burden for the patient's family and for the community, making it a disease of major public health importance [8]. Epidemiological features of schizophrenia are many due to the specific symptoms, behavioral imbalance and chronic course [9]. The disease occurs in 1% of the general population and it is one of the ten leading causes of disability in the population between 15 and 44 years of age [8].

Oral health is significant for general health and should not be separated from mental health [10]. The disease which has a large impact on oral health of general population is caries [11]. Previous studies in other countries have shown an increased occurrence of caries in psychiatric patients compared to mentally healthy people. Psychiatric patients have more caries and extracted teeth, and less filled teeth [12–14]. It is reasonable to expect that the prevalence of dental caries in hospitalized patients with schizophrenia should be higher than in healthy individuals for several reasons: psychiatric disease leads to a weakening habits in oral hygiene, some antipsychotic drugs cause adverse effects in the oral cavity, such as dry mouth, the access of these patients to the dentist is, as a rule, limited, for several reasons [15, 16].

In Serbia no research has been conducted related to oral health of this vulnerable group of psychiatric patients, although this disease in Serbia is present in 1% of the population, and these patients occupy 50% of hospital beds in psychiatric institutions in Serbia [17]. Therefore, the aim of this study was to establish condition of present teeth, to determine the prevalence of dental caries and consider possible risk factors that have contributed to the current oral health status of hospitalized patients with schizophrenia.

Methods

The study was conducted as an observational cross-sectional study. It had received approval of the Ethics Committee of the Clinic for Psychiatric Disorders "Dr Laza Lazarević" in Belgrade and the Faculty of Dental Medicine, University of Belgrade. The research was conducted in accordance with the Declaration of Helsinki. The participation of all participants was voluntary. Each participant was informed, through a special brochure, of the type of the research, data collection procedure, and other aspects of the study, and written consent was obtained from all subjects or their legal representatives to use personal data for research purposes.

Two groups of participants were formed: the study group comprised 190 randomly selected patients with schizophrenia, hospitalized at the Clinic for Psychiatric Disorders "Dr Laza Lazarević" in Belgrade. The sample size was determined in regard to the prevalence of schizophrenia in general population in the Republic of Serbia [8], with 95% confidence level. Therefore, the calculated sample size was 190. The inclusion criteria for the study were that the patient was hospitalized, older than 18 years and diagnosed with schizophrenia (according to the 10th Revision of the International Classification of Diseases) two years prior to the study. The exclusion criteria were the primary diagnosis of another mental disorder, hospitalized patients diagnosed with schizophrenia in the period shorter than two years from the time of the survey, the simultaneous presence of severe somatic illnesses or severe disability, and inability to communicate or the refusal to cooperate. The control group comprised 190 randomly chosen mentally healthy people who were being treated at the Clinic of Periodontology and Oral Medicine, Faculty of Dental Medicine, University of Belgrade. They were matched to the study group by number, gender and roughly by age. The exclusion criteria were the diagnosis of any psychiatric or somatic illness and the use of drugs that can cause oral changes (antibiotics, antifungals, blood pressure medications, corticosteroids, diabetes medications, etc.) [18].

All the participants were subjected to targeted dental examinations in accordance with the criteria recommended by the World Health Organization [19]. Dental check-ups were carried out by the dentist (first author) in the dental office at the Clinic for Psychiatric Disorders "Dr Laza Lazarević" in Belgrade, and the Clinic for Periodontology and Oral Medicine, Faculty of Dental Medicine. The examinations were perfomed in the daylight, using flat dental mirrors and sharp probes. Dental check-ups were carried out with the aim of measuring parameters for oral health evaluation and assessment of the decayed, missing, filled (DMF) index [20], which is used for oral health assesment. Clearly visible lesions with cavities on tooth surfaces were registered as caries; teeth with only a change in transparency, but with intact surface and without cavitation were registered as being healthy.

A questionnaire was designed for the study with the aim to record socioeconomic and demographic characteristics of the participants. It also recorded health data from medical records related to a mental disorder (the diagnosis, duration of the disease, previous hospitalizations and current medications).

The primary data obtained entered the SPSS 17.0 and were analyzed by descriptive statistical parameters, methods for testing hypotheses and regression models. The descriptive statistical methods were represented by the measures of central tendency (mean and median), a measure of variability (standard deviation and variation interval) and were expressed in percentages. The methods for testing the difference in numerical data (age, DMF index) were represented by the t-test of the independent groups. If there were no grounds for application of the parametric statistical methods, Mann-Whitney or Kruskal-Wallis test were applied. For testing data of different cathegories (gender, education level, employment status, marital status and residence), Pearson's χ^2 test was used.

Results

The study group comprised 190 hospitalized patients with schizophrenia, 95 males and 95 females, the mean age being: mean ± SD = 43.59 ± 11.95; med (min-max) = 43

(19–67) years. Most participants (32.1%) were in the age group over 50 years of age. In the control group there were 190 participants, 95 males and 95 females, the mean age being; mean ± SD = 43.20 ± 11.89; med (min-max) = 45.5 (19–72) years; the most participants (30%) were between 41 and 50 years of age. These data indicate the comparability of the groups concerning their age structure (Student's t-test for independent samples; $p = 0.747$).

Table 1
Characteristics of patients with schizophrenia

Characteristics	Number (%) of patients
Duration of disease (years)	
[($\bar{x}$ ± SD; med (min-max)]	14.69 ± 9.608; 14 (2–45)
≤ 10	67 (35.1)
11–20	82 (43.3)
21–30	30 (16.5)
≥ 31	11 (5.1)
Hospitalizations *per* patient (number)	
[($\bar{x}$ ± SD; Med (min-max)]	8. 52 ± 5.712; 7 (1–30)
≤ 10	129 (67.9)
11–20	55 (28.9)
≥ 21	6 (3.2)
Antipsychotic drugs *per* patient (number)	
[($\bar{x}$ ± SD; Med (min-max)]	1.64 ± 0.657; 2 (1–3)
1	87 (45.8)
2	84 (44.2)
3	19 (10.0)
Antipsychotic drugs	
haloperidole	52 (27.4)
clozapine	34 (17.9)
chlorpromazine	34 (17.9)
olanzapine	34 (17.9)
Other medications	
antiepileptics	135 (71.1)
hypnotics and sedatives	63 (33.2)
anxiolytics	160 (84.2)
antidepressants	15 (7.9)
antiparkinsonics	110 (57.9)

Most of the participants of the study group had the diagnosis of residual schizophrenia (42.6%) and paranoid schizophrenia (37.9%). The disease lasted over 14 years on the average (from 2 to 45 years), and the average number of hospitalizations was 8.52 ± 5.71 (from 1 to 30). The patients were treated with an average of 1.64 ± 0.66 antipsychotics (1 to 3 drugs). Most patients had been treated with one or two antipsychotics (45.8% and 44.2%, respectively). Apart from antipsychotic drugs, the patients commonly received haloperidole (alone or in combination with other antipsychotics), and they were receiving other drugs, too (Table 1).

Socioeconomic and demographic characteristics of the respondents are shown in Table 2. Statistically significant differences were observed between the level of education, employment status, marital status and ownership of the residence. Educational structure of hospitalized patients with schizophrenia was lower than that in the control group. Also, the percentage of employees among hospitalized people with schizophrenia was significantly lower than that in healthy individuals. Hospitalized people with schizophrenia were in the highest percentage unmarried (68.9%) in contrast to the control group (45.3%). Only 33.7% participants of the study group had residence in their ownership, as opposed to mentally healthy individuals (52.6%).

The patients of study group had significantly more carious and extracted teeth, and five times less filled teeth than patients of the control group. The mean value of the DMF index in the study group also was significaly higher than in the control group (Table 3).

The mean values of the DMF index in the subgroups showed a statistically significant difference (Table 4) in comparison to the control group. The highest value of the DMF index in the studied group had the patients older than 50 years of age, those who suffered from the disease for a

Table 2
Socioeconomic and demographic characteristics of the participants

Characteristics	Participants		p-values*
	Study group, n (%)	Control group, n (%)	
Educational level			
without school / primary school	40 (21.1)	6 (3.2)	
secondary school	109 (57.3)	93 (48.9)	
high school	16 (8.4)	33 (17.4)	
faculty	25 (13.2)	58 (13.2)	0.000
Employment			
unemployed / occasionally employed	117 (61.6)	99 (52.1)	
employed	10 (5.2)	73 (38.4)	
disability pension	37 (19.5)	3 (1.6)	
age / surviver pension	26 (13.7)	15 (7.9)	0.000
Marital status			
married	21 (11.1)	67 (35.3)	
divorced	30 (15.8)	31 (16.2)	
unmarried	131 (68.9)	86 (45.3)	
widow	8 (4.2)	6 (3.2)	0.000
Residence			
own property	64 (33.7)	100 (52.6)	
parents property	101 (53.2)	40 (21.1)	
rent	9 (4.7)	49 (25.8)	
other	16 (8.4)	1 (0.5)	0.000

*Pearson's χ^2 test.
Study group – patients with schizophrenia; Control group – mentally healthy people treated at the Clinic of Periodontology and Oral Medicine.

Table 3

Distribution of carious, extracted, filled teeth and the value of the decayed, missing, filled (DMF) index

Variables	Study group		Control group		p-values*
	x̄ ± SD; med (min–max)	% of patients	x̄ ± SD; med (min–max)	% of patients	
Carious teeth	7.59 ± 5.563; 7 (0–31)	40.9	2.15 ± 2.609; 6.5 (0–13)	17	0.000
Extracted teeth	8.77 ± 7.928; 7 (0–28)	47.2	3.27 ± 3.791; 9.5 (0–19)	27.3	0.000
Filled teeth	2.21 ± 2.852; 1 (0–14)	11.9	6.97 ± 4.060; 9.5 (0–19)	55.6	0.000
DMF index	18.57 ± 7.068; 19 (3–32)	100	12.47 ± 5.644; 14.5 (1–28)	100	0.000

* Mann-Whitney test.
Study group – patients with schizophrenia; Control group – mentally healthy people treated at the Clinic of Periodontology and Oral Medicine.

Table 4

The mean values of the decayed, missing, filled (DMF) index among patients with shizophrenia

Characteristics	The mean value of DMF index [(x̄ ± SD; med (min-max)]	p-values
Gender:		
men	18.76 ± 7.114; 18 (4–32)	
womens	18.39 ± 7.055; 19 (3–32)	0.787*
Age (years):		
≤ 30	14.85 ± 7.262; 14.5 (3–32)	
31–40	15.80 ± 6.535; 16 (3–30)	
41–50	19.52 ± 6.238; 20 (5–32)	
≥ 51	21.92 ± 6.288; 22 (4–32)	0.000[†]
Duration of disease (years):		
≤ 10	16.67 ± 6.673; 16 (3–29)	
11–20	18. 38 ± 7. 368; 18 (3–32)	
21–30	22.27 ± 5. 447; 22.5 (12–32)	
≥ 31	21.55 ± 6. 962; 22 (4–29)	0.001[†]
Hospitalization (number)		
≤ 10	17.64 ± 7.110; 18 (3–32)	
11–20	20.29 ± 6.235; 19 (5–32)	
≥ 21	23.00 ± 9. 798; 27.5 (4–30)	0.013[†]
Antipsychotic drugs, number *per* patient		
1	18.41 ± 7.592; 19 (3–32)	
2	18.73 ± 6. 908; 18.5 (3–30)	
3	18.63 ± 5.377; 18 (9–30)	0.980[†]
Other medications		
antiepileptics		
yes	18.55 ± 6. 771; 18 (3–32)	
no	18.59 ± 7. 210; 19 (3–32)	0.884*
hypnotics and sedatives		
yes	17.97 ± 7. 542; 18 (3–32)	
no	19.79 ± 5. 867; 19 (5–32)	
anxiolytics		
yes	17.80 ± 7. 658; 17. 5 (4–29)	
no	18.72 ± 6. 968; 19 (3–32)	0.172*
antidepressants		
yes	18.65 ± 7. 111; 19 (3–32)	
no	17.67 ± 6. 715; 16 (8–28)	0.513*
antiparkinsonics		
yes	17.28 ± 7. 412; 17.5 (3–32)	
no	19.52 ± 6. 684; 20 (4–32)	0.049*
Education level		
without school / primary school	20.23 ± 7. 794; 21.5 (3–32)	
secondary school	18.48 ± 6. 890; 18 (3–32)	
high school	17.88 ± 6. 541; 18.5 (5–28)	
faculty	16.80 ± 6. 795; 16 (4–29)	0.226[†]
Employment		
unemployed / occasionally employed	17.90 ± 7.475; 18 (3–32)	
employed	18.10 ± 6.574; 15.5 (9–28)	
disability pension	18.46 ± 6.145; 18 (5–30)	
age / surviver pension	21.96 ± 5.862; 23.5 (9–29)	0.074[†]
Marital status:		
married	21.57 ± 5.904; 22 (8–29)	
divorces	17.80 ± 6. 562; 18.5 (4–28)	
unmarried	18.07 ± 7. 105; 18 (3–32)	
widow	21.88 ± 9. 311; 26 (3–28)	0.054[†]
Residence:		
own property	19.66 ± 7.087; 20.5 (3–30)	
parents property	17.58 ± 7.102; 18 (3–32)	
rent	16.22 ± 7.102; 16 (5–28)	
other	21.81 ± 5.406; 20.5 (15–32)	0.054[†]

*Mann-Whitney test; [†]Kruskal-Wallis test.

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long time, and patients who were more often hospitalized. Depending on the drugs used, a statistically significant difference in values of the DMF index was observed between those patients who were taking and those who were not taking antiparkinsonic drugs. The highest values of the DMF index in the study group had patients who were taking antiparkinsonic drugs (Table 4).

The impact of sociodemographic and economic characteristics, as well as the characteristics of the underlying disease, on the value of the DMF index among the study group patients was examined by linear regression model. Univariate regression analysis emphasized age of the participants, total duration of illness, number of hospitalizations and use of antiparkinsonic. However, statistically significant factors separated in the univariate linear model were included into the multivariate regression model, showing a statistical significance only for the age of the participants and application of antiparkinsonic drugs (Table 5).

health education of patients. The mean DMF index of hospitalized patients with schizophrenia in this study was 18.57 ± 7.07, and carious and extracted teeth dominated in its structure. Age, total duration of the disease and total number of hospitalizations significantly affected the DMF index value. Used drugs and sociodemographic and economic characteristics of participants did not influence the results significantly, which suggests that the underlying disease affects oral health indirectly, reducing patients' motivation for preservation of oral health.

The mean value of the number of carious teeth in hospitalized patients with schizophrenia, in this study, was 7.59 ± 5.56, which is almost twice as much as in the research performed by Arnaiz et al. [12], and four times more than in the study of Adeniyl et al. [21]. Naturally, the higher number of carious teeth in people with schizophrenia, noticed in this study, may be explained by hyposalivation associated with antipsychotics that have antimuscarinic effect [22]. Hyposalivation was even

Table 5
The value of the decayed, missing, filled (DMF) index, examined by linear regression models, among patients with shisophrenia

Characteristics	Univariate linear regression analysis		Multivariate linear regression analysis	
	[#]B (95%CI)	p-values	[#]B (95% CI)	p-values
Age of participants	0.212	0.000	0.210	0.000*
Gender of participants	-0.846	0.412	/	/
Educational level	-0.966	0.085	/	/
Employment	0.556	0.052	/	/
Marital status	-0.963	0.183	/	/
Residence	0.394	0.523	/	/
Duration of disease	0.133	0.018	-0.710	0.330
Number of hospitalizations	0.276	0.003*	0.139	0.231
Number of antipsychotic drugs	0.281	0.717	/	/
Antiepileptics	0.470	0.682	/	/
Anxiolytics	1.999	0.170	/	/
Hypnotics and sedatives	1.703	0.120	/	/
Antidepressants	-2.008	0.310	/	/
Antiparkinsonics	2.382	0.022*	2.242	0.021*

*statistical significance; [#]Unistandardized Coefficient B; CI – confidence interval.

Discussion

The research enabled assessment of dental status of hospitalized patients with schizophrenia, determining the prevalence of dental caries and potential risk factors that might contribute to this state of the oral health. When interpreting the values obtained for the DMF index, in addition to the importance of its absolute value, the value of each parameter of its structure (carious, extracted and filled teeth) is also essential. When the value of the DMF index is large indicating domination of filled teeth, it points to the fact that the overall oral health of the patient was previously bad, but that dental health service is well organized and the patients' motivation exists. However, if the value of DMF index is large indicating domination of carious teeth (including extracted teeth as well), it shows a patient's lack of awareness concerning the need of periodic visits to the dentist, difficult availability of dental health service or poor preventive health programs and

more pronounced because many patients were treated with conventional antipsychotics (first generation antipsychotics), such as haloperidole. Results of Tani et al. [23] showed that the majority of their patients used risperidone and olanzapine, a newer generation of antipsychotics. Hyposalivation consequently leads to a buildup of dental plaque on marginal gingiva, which is a major etiologic factor for the occurrence of caries [11]. However, in addition to hyposalivation, antipsychotics lead to extrapyramidal syndrome, which is reflected in the involuntary motor functions [8], which further prevent patients to maintain regular and adequate oral hygiene encouraging accumulation of dental plaque. The results of this study show a relatively little value of filled teeth in the DMF index (2.21 ± 2.85), indicating the lack of motivation for rehabilitation of carious teeth and weakening habits in maintaining oral hygiene as well [15, 16].

The mean age of the hospitalized participants was 43.59 ± 11.96, which is similar to other studies [6, 12, 21]. The disease, on the average lasted 14.69 ± 9.61 years, which is lower than

previously reported [23]. The patients were treated with the average number of 1.64 ± 0.66 antipsychotics (1 to 3 drugs), which is also similar to the reported results [12, 23]. The parameter that is tracked in the research of other authors was the duration of the last hospitalization. This study showed a large number of hospitalizations per patient (8.52 ± 5.71; 1–30), which points to the fact that the patients were hospitalized for a proportionally long period of time.

This survey also found that most of the patients had completed secondary school (57.4%), which is consistent with the results obtained by the study of Adeniyl et al. [21]. The majority of participants were unemployed, unmarried and lived with their parents. Similar results were obtained by Chu et al. [22], where 76.9% of participants were unmarried, and 78.3% of lower sociodemographic and economic status.

This study showed that the age of participants and the application of antiparkinsonics could influence the DMF index in hospitalized patients with schizophrenia. However, it seems that high value of the DMF index can be expected in older subjects and in subjects treated with antiparkinsonics. Similarly, previous studies showed an association between age and increased incidence of dental caries and higher values of DMF index. When it comes to the application of antiparkinsonic drugs, a survey conducted in Bosnia, among females suffering from schizophrenia, showed similar results [24]. Women who, in addition to antipsychotic drugs, were receiving antiparkinsonic drug biperiden which is of anticholinenergic type had higher values of the DMF index than women treated with antipsychotic drugs only (antiparkinsonics were used to suppress the effects of parkinsonism, tremor and akinesia, consequently caused by antipsychotic drugs).

Summarizing the results, this study showed a high prevalence of caries in hospitalized patients with schizophrenia and high value of the DMF index, considerably higher compared to healthy population, but also in comparison with mentally ill persons in the world [6, 13, 21, 22]. The population of schizophrenic persons is certainly of lower socioeconomic status. The characteristics of the underlying disease did not significantly affect the high value of the DMF index. As the predictors for the increased DMF index, the age of participants and the application of antiparkinsonic drugs with anticholinenergic effects could be stressed.

There are two possible limitations of this study: firstly, all the patients of the study group were hospitalized at the Clinic for Psychiatric Disorders which has a separate dental office enabling dental care within patients' reach. Therefore, the results could be even worse in other psychiatric hospitals. Secondly, patients of the control group used to regularly visit the Clinic for Periodontology and Oral Medicine, and the results concerning their DMF index were possibly slightly better than in general population.

It is important to stress that our own experience in treating hospitalized patients with schizophrenia suggests that this population of the psychiatric patients is not especially difficult for establishing communication necessary to complete dental treatment. During their hospitalization, they showed apparent interest for taking care of their oral health and desire to repair their teeth. Even more, most of them seek recommendations for continuation of dental treatments after termination of hospitalization. However, in our society still exist prejudices among dental personnel concernig motivation for improving oral and general health of mentally ill persons, which should be overcomed.

Conclusion

The results of this study indicate the need for continuous research of oral health of psychiatric patients in general in order to determine the current state of their oral health and determine modes of its improvement, with the emphasisis on primary systems of health care, and implementation of optimal measures for its improvement.

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