ORIGINAL RESEARCH

The Comparison of Oral Health Status Between Psychotic and Non-Psychotic Mental Disorder Patients

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KEYWORDS	ABSTRACT
Mental disorders; Psychotic disorders; Oral health; DMF-T; Oral Hygiene	Psychotic mental disorder characterized by psychotic symptoms such as delusions and hallucinations, while non-psychotic mental disorder does not involve severe impairment in recognizing reality. Both mental disorders are predicted to show differences in oral health, as demonstrated by oral health status assessments. The purpose of this article is to compare the oral health status between psychotic and non-psychotic mental disorders patients. This is a cross-sectional study involving 40 respondents aged 18 – 55 years old. Patients with orthodontic appliances or diabetes mellitus were excluded. DMF-T Index and OHI-S examinations were used as oral health status assessments. The statistical test was using the Mann-Whitney test. Significant differences (p<0,05) was obtained. The results showed that psychotic mental disorder patients had higher median values (6,72; 2,16), compared to non-psychotic mental disorder patients (3,00; 1,00) based on DMF-T Index (p=0,016) and OHI-S (p=0,000). In conclusion, patients with psychotic mental disorders had worse oral health than those with non-psychotic mental disorders, based on the DMF-T Index and OHI-S.

1. INTRODUCTION

Mental disorders can be divided into 2 major groups such as psychotic and non-psychotic mental disorders. Severe mental illness, or may be known as psychotic mental disorders, has many symptoms such as hallucinations, illusions, delusions, thinking and sense of reality disruptions.[1] non-psychotic mental disorders can be seen by mental status examination, where there is no severe impairment in recognizing reality. The prevalence of psychotic mental disorders in the population of Indonesia was 1,7 out of 1000 population.[2] Due to their symptoms, individuals with mental disorders often struggle to take care of their personal and oral hygiene.[3]

A few oral health problems such as tooth decay, tooth loss, or dry mouth may associated with mental disorders' symptoms; other than that, it may come from the side effects of psychiatric pharmacotherapy and less adherence to oral health care, leading to a condition called xerostomia.[4][5] Xerostomia is a condition where salivary secretion decreases and causes dry mouth, thereby decreasing oral hygiene and accelerating the occurrence of dental caries because it can affect the acidity (pH) of the oral cavity, so that the bacterial colonization and caries occurrence increase. Mental disorder patients who are given pharmacotherapies can be more susceptible to having caries experience and lower oral health status due to the consumption of the medications with oral side effects, thereby the DMF-T Index scores tend to be higher.[6]

Many previous studies had mentioned that the oral health status in psychiatric patients is worse than human in general. Therefore, this research would focus on comparing 2 groups of mental disorders, such as psychotic and non-psychotic mental disorders, to acknowledge which mental disorder has the worst oral health status.

2. METHODOLOGY

Study Design

This research was an observational, analytical study with a cross-sectional approach. The sample of this research was divided into 2 groups, which were psychotic and non-psychotic mental disorder patients in the Psychiatry Clinic of RSND (Diponegoro National Hospital), Semarang.

This research was conducted from November 2019 to January 2020. The sampling method used was consecutive sampling, where the patients who arrived were asked if they were willing to be examined based on their teeth using the DMF-T Index (Decay, Missing, Filled Teeth) and OHI-S (Oral Hygiene Index Simplified) assessments.

Patients Criteria

Psychotic mental disorder patients included schizophrenia, depression and bipolar disorders with psychotic symptoms, while non-psychotic mental disorder patients were anxiety disorder, depression and bipolar disorders (without psychotic symptoms). These patients were diagnosed by the psychiatrist of RSND Semarang, as proven by the medical records. Thus, no questionnaire needed to diagnose the disorder by the researcher.

Inclusion criteria for the participants were male or female patients aged 18 – 55 years old, no hearing and visual impairments, and who agreed to participate by signing the informed consent form (by themselves if able, or by their guardians). Patients with smoking habit or who had diabetes mellitus were not included in this research.

DMF-T Index

The DMF-T Index examination procedure began by checking the participants' teeth from region 1 (upper right), then to region 2 (upper left), to region 3 (lower left), and then region 4 (lower right). The examination was done by using a sharp instrument and mouth mirror to assess the presence of cavities, missing teeth due to being extracted, or filled teeth, and finally, the scores were marked in the examination form.

OHI-S

The OHI-S examination procedure was performed to see the debris and calculus in the patient's teeth. Examination started from teeth number 16, 11, 26, 36, 31, and 46. Disclosing solution was applied onto the teeth surfaces using a cotton bud. Patients were asked to rinse once and not too strong, so that the staining did not fade. Then, the surface color of those teeth was examined with a mouth mirror and sharp instrument to see the calculus and debris according to the scoring. The sum of the Calculus Index and Debris Index scores was calculated, and the results were categorized according to the OHI-S score.

Statistical Analysis

Researcher checked the whole data completely and continued to the data processing consisting of editing, coding, entry, and data analysis. Univariate analysis was to explain the characteristics of each variable, including independent variables, dependent variables, and other variables, including sex, age category, and class of psychiatric medications consumed by research participants. Furthermore, data were presented in the form of frequencies and percentages and then proceeded with bivariate analysis. Shapiro-Wilk was used as a data normality test, and the distributions of data were not normal, so the Mann-Whitney statistical test was operated as a non-parametric statistical analysis. The significance test of the observed data was carried out with a significance limit of $p < 0.05$.

3. RESULTS

The results of statistical data processing showed that the characteristics of the research subjects included sex, age, independent variables, and dependent variables. Based on **Table 1**, the research sample consisted of 40 patients, including 11 male patients and 29 female patients. The mean value of male patients in the DMF-T Index or OHI-S was higher than female patients, indicating that the oral health status of male patients was worse than female patients. The mean and median values of early elderly patients were higher than other age categories based on the DMF-T Index, which suggests that older age may lead to higher mean and median values of the DMF-T Index. In the OHI-S, the age category with the highest value was late adulthood. The number of research subjects with psychotic and non-psychotic mental disorders was 20 people each. The mean and median DMF-T and OHI-S indices in psychotic patients were higher than in non-psychotic patients.

Variable	F	%	DMF-T Index		OHI-S	
			Mean±SD	Median	Mean±SD	Median
Sex						
Male	11	27,5%	6,45±4,591	4,00	1,76±1,314	1,60
Female	29	72,5%	5,10±4,22	4,00	1,537±0,766	1,60
Age Category						
Late Teenager (18-25)	30	75%	4,40±4,09	3,00	1,443±0,838	1,40
Early Adult (26-35)	4	10%	6,00±1,826	6,00	1,40±0,616	1,15
Late Adult (36-45)	4	10%	9,00±2,16	9,50	2,862±1,313	2,23
Early Elderly (46-55)	2	5%	13,50±0,707	13,50	1,80±0,282	1,80
Group of Patient						
Psychotic	20	50%	6,90±4,09	6,72	2,115±0,935	2,16
Non-Psychotic	20	50%	4,05±4,136	3,00	1,082±0,599	1,00

Table 1. Characteristic of Research Subjects

Table 2 shows the frequency of psychotic and non-psychotic patients taking psychiatric medications. Antipsychotic medications were used 10 times (26.31%) by psychotic patients and 2 times (5%) by non-psychotic patients. Antidepressant medications were consumed 12 times (31.57%) by psychotic patients and 17 times (42.5%) by non-psychotic patients. Psychotic patients consumed 9 anti-insomnia medications (23.68%), while non-psychotic patients consumed 18 medications (45%). Non-psychotic patients did not consume any anticholinergic medications, whereas psychotic patients took 4 anticholinergic medications (10.52%). Three antiseizure medications were consumed by psychotic patients (7.89%) and by non-psychotic patients (7.5%).

Psychiatric Medications	Psychotic		Non-Psychotic	
	F	%	F	%
Anti-psychotic	10	26,31%	2	5%
Anti-depressant	12	31,57%	17	42,5%
Anti insomnia	9	23,68%	18	45%
Anti cholinergic	4	10,52%	0	0%
Anti-seizure	3	7,89%	3	7,5%

Table 2. Characteristic of Medications Used by Research Subjects

The data distribution of DMF-T Index and OHI-S scores among the types of patients was not normally distributed; therefore, the Mann-Whitney test was used to assess the significance between both groups. **Table 3** shows that the mean and median of DMF-T Index scores for psychotic patients were higher (6.90 ± 4.09 and 6.72, respectively) compared to non-psychotic patients (4.05 ± 4.136 and 3.00). Statistical analysis yielded a p-value of 0.016, indicating a significant difference ($p < 0.05$). This suggests that caries status, as measured by the DMF-T Index, was worse in psychotic patients than in non-psychotic patients.

In addition, the mean and median of OHI-S scores in psychotic patients were also higher than those in non-psychotic patients. The mean and median values for psychotic patients were (2.115 ± 0.935 and 2.16), while for non-psychotic patients, the values were (1,082 ± 0.599 and 1.00). The analysis also showed a significant difference ($p < 0.05$), indicating that oral hygiene conditions in psychotic patients were significantly worse than those in non-psychotic patients.

Index	Mean±SD		Median		p-value
	Psychotic	Non-Psychotic	Psychotic	Non-Psychotic	
DMF-T Score	6,90±4,09	4,05±4,136	6,72	3,00	0,016*
OHI-S Score	2,115±0,935	1,082±0,599	2,16	1,00	0,000*

Table 3. The mean and median distribution of DMF-T Index and OHI-S in Psychotic and Non-Psychotic Mental Disorders Patients. *(p <0,05)

4. DISCUSSION

Sex and Age Categories toward Oral Health Status

Based on the characteristics of the research subjects, male psychiatric patients had higher mean values for both the DMF-T Index and OHI-S compared to female patients. This finding is similar to previous study by Bertaud-Gounot (2013), which reported that females with mental disorders had better oral health conditions than males based on the DMF-T Index examination.[7] However, the comparison in oral health status based on sex in this research cannot be considered conclusive due to the unequal distribution of male and female participants.

The analysis of age categories based on the DMF-T Index showed higher mean values in the older age groups, meaning that based on caries assessment, older patients had worse oral health conditions. This aligns with findings from previous studies, such as by Teng (2011), who found that patients and schizophrenic patients of older age had higher DMF-T Index scores than younger patients.[8]

However, the OHI-S analysis in this research indicated that the age group with the worst oral hygiene was the late adulthood group, while the early adult group had the best oral hygiene. The results of the DMF-T and OHI-S did not show a linear pattern across age categories and differed from previous studies. This can be caused by the unequal distribution of participants across age categories, with a majority concentrated in the late adult age category (30 people) and very few in the early elderly group (2 people).

Group of Patients toward Oral Health Status

Based on the results of statistical analysis, the median of the DMF-T Index for the psychotic patients group was 6.72, whereas for the non-psychotic patients group, it was 3.00. In the OHI-S examination, the median value for the psychotic patients group was higher (2.16) compared to the non-psychotic patients group (1,00). Both index measurements showed that the psychotic group had higher values than the non-psychotic group, with higher values indicating poorer oral health status. Bivariate analysis showed significant differences between the two groups, indicating that patients with psychotic mental disorders had significantly worse oral health compared to non-psychotic patients. These findings are consistent with the results of a study conducted by Lalloo (2013), which reported that patients with schizophrenia and nonaffective psychosis had higher DMF-T mean value compared to bipolar affective patients.[9]

Oral Health of Psychotic Mental Disorders

A specific characteristic of the psychotic mental disorder group is the presence of psychotic or positive symptoms, such as delusions and hallucinations, which can cause cognitive distortions and reduce patients' ability to maintain proper personal hygiene.[10] The antipsychotic medications commonly consumed by this group included typical antipsychotics, such as haloperidol, chlorpromazine, and trifluoperazine. These typical antipsychotics have an affinity or binding ability to muscarinic receptors, H1 histamine, and alpha 1, which are frequently associated with xerostomia. A study including patients and animals reported that typical antipsychotics caused xerostomia more often than atypical antipsychotics.[11] In addition to typical antipsychotics, many patients in this research were also prescribed tricyclic antidepressants, such as sandepril and amitriptyline. One study reported that xerostomia was experienced by 70-85% of patients taking tricyclic antidepressants compared to only 15-35% of patients taking SSRIs (selective serotonine reuptake inhibitors). Tricyclic antidepressants also had affinity for muscarinic, alpha-adrenergic receptors, and histamine H1, with xerostomia as the most common side effect.[12]

Oral Health of Non-Psychotic Mental Disorders

Loss of interest in patients with depression and bipolar disorder, and behavioral changes in those with anxiety, can negatively impact dental and oral health. Patients who previously were capable of maintaining oral hygiene may lose interest in personal care, leading to an increased risk of developing caries, as the most common dental and mouth problem in non-psychotic mental disorder group.[13] A study by Costa (2019) reported that patients with bipolar affective disorder had poorer oral health, showing a high prevalence of periodontitis and a higher frequency of periodontal diseases, which can lead to tooth loss.[14]

In the non-psychotic mental disorder group, commonly used medications included SSRI antidepressants, such as fluoxetine and sertraline, as well as benzodiazepine anti-insomnia medications, such as lorazepam, clobazam and alprazolam. SSRIs have a low affinity for muscarinic and histamine receptors, resulting in a lower occurrence of xerostomia compared to tricyclic antidepressants.[15] However, benzodiazepines are known to reduce salivary flow when used for a long period of time, causing dry mouth on a mild to high scale, then increasing the incidence of caries.[16] This group of non-psychotic patients generally had better oral health, which may be attributed to their outpatient status. Being outpatients allowed their symptoms to be under control, which may lead them to take care of their personal hygiene quite well.

This research highlights that dental and oral hygiene of psychotic mental disorder patients were worse than non-psychotic mental disorder patients. Several factors may contribute to this finding, including delusions and hallucinations that interfere with self-care, medications with higher side effect of xerostomia, infrequent tooth brushing and dental checkups, smoking history, and inadequate nutrition.[17] Due to the poor oral health status of individuals with severe mental illness, Kisely (2016) suggested interventions such as providing accessible dental care, managing medication-induced xerostomia, and ensuring multidisciplinary referrals to dental professionals.[18]

The limitations of this study include the lack of identifying the definitive factors that caused oral health conditions among two groups. Additionally, this research still lacked demographic diversity, such as the level of education, socioeconomic status, residence (rural or urban), and a limited age distribution with majority of late teenagers because the research was conducted only in the university hospital. There was also a possibility of bias in the OHI-S examination, as it was unknown whether the patients had brushed their teeth or recently had eaten before the assessment, which could affect the debris score.

Recommendations for further studies are needed to improve this research by adding additional variables to identify factors that may affect the oral health of mental disorder patients, such as specific symptoms, duration of medication use, and patients' dental health knowledge and habits. Moreover, increasing the sample size to obtain a diverse demographic and controlling for potential dental examination bias are also required.

5. CONCLUSION

In conclusion, this study found significant differences in oral health status between psychotic and non-psychotic mental disorder patients, as assessed by DMF-T Index and OHI-S. The results indicated that patients with psychotic mental disorders had poorer oral health compared to those with non-psychotic mental disorders.

Conflict of Interest

The authors declare no conflicts of interest in this study.

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Authors Contribution

Conceptualization: ZDA, SB, NDW, AAA; Methodology: ZDA, SB, NDW, AAA; Formal Analysis: ZDA, SB, NDW; Original Draft Writing: ZDA; Supervision and Editing: SB, NDW, AAA; Administration: ZDA.

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Reference

[1] Drake RE, Whitley R. Recovery and Severe Mental Illness: Description and Analysis. Can J Psychiatry. 2014; 59(5):236–242.

[2] Badan Penelitian dan Pengembangan Kesehatan. Riset Kesehatan Dasar (RISKESDAS) 2013. Lap Nas; 2013.

[3] Yosep, Iyus .Keperawatan Jiwa Edisi Revisi. Bandung : Refika Aditama;2009.

[4] Amita Aditya, Shailesh Lele. Association Between Psychosocial Disorders and Oral Health. Journal of Dental and Allied Sciences. 2015. 4(2): 84-88.

[5] N Cockburn, A Pradhan, MW Taing, S Kisely, PJ Ford. Oral health impacts of medications used to treat mental illness. J Affect Disord. 2017. 223: 184-193.

[6] Edgar, M, Dawes, C, O'Mullane, D. Saliva and Oral Health. 4th Ed. Stephen Hancocks Limited; 2012.

[7] V Bertaud-Gounot, V Kovess-Masfety, C Perrus, G Trohel, F Richard. Oral health status and treatment needs among psychiatric inpatients in Rennes, France: a cross-sectional study. BMC Psychiatry. 2013. 13: 227.

[8] PR Teng, JM Su, WH Chang, TJ Lai. Oral health of psychiatric inpatients: a survey of central Taiwan hospitals. General Hospital Psychiatry. 2011. 33(3): 253–259.

[9] Lalloo R, Kisely S, Amarasinghe H, Perera R, Johnson N. Oral health of patients on psychotropic medications: a study of outpatients in Queensland. Australas Psychiatry 2013;21:338-42.

[10] Sadock, BJ, Sadock, VA. Buku Ajar Psikiatri Klinis. Edisi 2. Jakarta: EGC; 2010. 177

[11] Sreebny LM, Schwartz SS. A reference guide to drugs and dry mouth 2nd edition. Gerontology. 1997; 14(1):33-47.

[12] Jelena R. Pharmacodynamic Causes of Xerostomia in Patients on Psychotropic Drugs. Acta Scientific Dental Sciences. 2018; 2(11): 102-106.

[13] Nalliah RP, Da Silva JD, Allareddy V. The characteristics of hospital emergency department visits made by people with mental health conditions who had dental problems. J Am Dent Assoc. 2013; 144(6):617-24.

[14] Costa FO, Cunha F, Lima R. Association between Bipolar Affective Disorder and Periodontal Diseases. IntechOpen. 2019: 1-11.

[15] Shah VR, Jain P, Patel N. Oral health of psychiatric patients: A cross-sectional comparison study. Dental Research Journal. 2012;9(2): 209-214.

[16] Jaume MR, Lluís BL, Eduard LS, Magí F. Salivary Secretory Disorders, Inducing Drugs, and Clinical Management. Int. J. Med. Sci. 2015; 12(10): 811-824.

[17] Torales J, Barrios I, González I. Oral and dental health issues in people with mental disorders. Medwave. 2017; 17(8):7045.

[18] Kisely S. No Mental Health Without Oral Health. Can J Psychiatry. 2016; 61(5): 277-282.