Original paper

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Oral Health Status and Dental Anxiety in Psychiatric Patients

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Keywords

Dental anxiety; depressive disorder; alcoholism; sociodemographic factors

Abstract

Aim: Dental anxiety is an anxiety state arising from dental treatment procedures, often associated with negative experiences and expectations, leading to avoidance of dental visits and poorer oral health. This study aims to determine the prevalence of dental anxiety among patients with depression and alcohol addiction using a validated dental anxiety questionnaire, compare these two groups, and assess whether dental anxiety is associated with sociodemographic characteristics. **Subjects and Methods:** A total of 65 patients treated at the University Hospital Center Sestre Milosrdnice participated in the study. The participants were divided into two groups: 31 patients diagnosed with depression and 34 patients diagnosed with alcohol addiction, without comorbidities. Data were collected using a sociodemographic questionnaire and Corah's Dental Anxiety Scale (DAS). Statistical analysis was performed using SPSS, with t-tests and analysis of variance (ANOVA) applied. **Results:** Dental anxiety was found in 40 (61.5 %) participants. It was more prevalent among patients with depression (26/31; 83.9 %) compared to those with alcohol addiction (14/34; 41.2 %). A significant difference was observed between the two groups ($t = 3.437$, $p < 0.01$). No significant association was found between sociodemographic characteristics and dental anxiety. **Conclusion:** The findings indicate a higher prevalence of dental anxiety in psychiatric patients, particularly among those with depression. These results highlight the need for better education of dental professionals to improve their approach to psychiatric patients, recognize dental anxiety, and reduce stigma. Addressing this issue may help prevent dental avoidance and improve oral health outcomes in these vulnerable populations.

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Introduction

Oral health represents one of the main determinants of general health for psychiatric patients. It is often neglected in depressive patients and generally in those addicted to various psychoactive substances. In practice, psychiatric patients are frequently stigmatized, and dentists often do not know how to properly approach their conditions [1]. There is a generally negative attitude among healthcare professionals toward individuals addicted to various psychoactive substances, which

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consequently reduces patient's feelings of belonging and motivation to care for their health, impacting treatment outcomes. Healthcare professionals often have a strictly professional approach towards patients, without much empathy [2]. As a result, patients remain unmotivated to maintain oral hygiene, and their dental anxiety may remain unrecognized or be attributed to part of their psychiatric diagnosis.

Depression represents a risk factor for maintaining oral health and often has a negative effect on the state of patients' oral health. Along with a negative perception of their oral health, there is a negative attitude towards visiting the dentist. Previous research has also reported potential biological mechanisms, including a connection between depression and reduced salivary flow, xerostomia, and dysregulation of the immune system and saliva's defense mechani and depressive patients generally have a higher prevalence of caries, tooth loss, and edentulism [3]. Also many medications used to treat depression have side effects that negatively affect oral health. Alcohol addiction is also accompanied by numerous social complications, primarily affecting family, then the work environment, and society at large [4,5]. Individuals who frequently consume alcohol have poorer oral hygiene, visit the dentist less frequently, have fewer teeth, more carious lesions, diseases affecting the gingiva, deep periodontal pockets with bone loss and interdental papilla bleeding, and a higher rate of oropharyngeal cancer. The high acid concentration in alcoholic drinks can cause chronic inflammation of the soft tissues of the oral cavity and negatively affect metals in various orthodontic appliances [4]. Direct impact of long-term alcohol consumption on oral tissues includes an increased prevalence of dental caries, periodontal diseases, tooth wear, and many precancerous conditions such as leukoplakia and erythroplakia, as well as oral cancer due to the direct toxic and dehydrating effect of ethanol on the mucosa. The social impact should also not be overlooked, including self-neglect (absence or reduction of oral hygiene) or accidental injuries during drunkenness (dental and jaw trauma) and, consequently, avoiding social contact. [6].

Dental anxiety is the state of worry that something bad will happen related to dental treatment, often accompanied by a feeling of loss of control [7]. Fear of dental controls or procedures is often the result of personal experiences of previously experienced pain, but very often also of unexperienced, but expected pain [8]. It manifests as an irrational and exaggerated emotional reaction and belongs to the group of state anxieties because it arises due to dental treatment procedures and is related to continuous negative experiences or expectations [9]. Patients with high levels of dental anxiety have more carious lesions and extracted teeth, a higher prevalence of periodontal disease, and fewer restored teeth. All this stimulates the occurrence of pain and is associated with inflammation and infection. Dental phobia is a more severe form of dental anxiety, characterized by persistent and exaggerated fear of dental stimuli and procedures, resulting in avoidance of dental visits or significantly elevated stress levels [10]. Odontophobia is a prevailing and irrational fear associated with dentistry, accompanied by overwhelming feelings of hypertension, dread, and discomfort, and is classified as a specific phobia [11]. There are simple and quick methods to assess dental anxiety include a semi-structured interview with the patient (where conversation uncovers situations and reasons for the patient's anxiety), dental anxiety questionnaires (such as DAS, MDAS, or DFS questionnaires), or objective measures such as blood pressure, pulse oximeter readings, fingertip temperature, and galvanic skin response [11].

In summary, dental anxiety can be managed with psychotherapeutic interventions, pharmacological interventions, or a combination of both. The choice of approach for managing anxiety must be left to the dentist and should always be based on an understanding of the individual patient, their personal history, specific concerns, and capacity for change. This deeper understanding requires first recognizing the patient's concerns and anxieties, exploring their underlying causes, and then working with the patient to manage their fears, allowing a gradual treatment plan to be successfully implemented [12].

Subjects and Methods

This study examined the prevalence of dental anxiety among psychiatric patients and its association with sociodemographic characteristics. Two groups of patients were analyzed—individuals with depression and individuals with alcohol dependence-as these are among the most common psychiatric diagnoses.

The study was conducted at the Psychiatry Clinic of the University Hospital Center Sestre Milosrdnice (UHCSM) during June and July 2024, and it was approved by the UHCSM Ethics Committee. A total of 65 individuals of varying ages, educational levels, and partnership statuses were included. Diagnoses of depression and alcohol dependence were made according to the International Classification of Diseases, 10th Revision (ICD-10). Of the participants, 36 (55.4 %) were men and 29 (44.6 %) were women. The sample included 31 individuals diagnosed with depression (47.69 %), without other comorbidities, and 34 individuals diagnosed with alcohol dependence (52.31 %), without other comorbidities, who were receiving treatment at the UHCSM Psychiatry Clinic at the time of the study.

Before the study commenced, all participants were offered the opportunity to participate voluntarily, and the purpose of the study was explained to them. The following instruments were used for the research: informed consent for study participation (prepared by the researchers), a sociodemographic questionnaire, and Corah's Dental Anxiety Scale (DAS)-a dental anxiety questionnaire that can be effectively used in dental practices or research projects. The collected data were statistically analyzed using IBM SPSS® Statistics, version 20.0 (Armonk, NY, USA). T-tests were used to examine the significance of differences in mean values between two independent samples, and variance analysis was used to assess differences among more than two independent samples. A p-value of < 0.05 was considered statistically significant.

Results

Table 1. Sociodemographic characteristics of participants

	All participants	Participants with depression	Participants with alcoholism
N	65	31	34
SEX			
male	36 (55.4 %)	9 (29 %)	27 (79 %)
female	29 (44.6 %)	22 (71 %)	7 (21 %)
AGE			
<20	0 (0 %)	0 (0 %)	0 (0 %)
21 - 30	4 (6.2 %)	2 (6 %)	2 (6 %)
31 - 40	11 (16.9 %)	3 (10 %)	8 (24 %)
41 - 50	15 (23.1 %)	8 (26 %)	8 (24 %)
51 - 60	22 (33.8 %)	13 (42 %)	9 (26 %)
> 60	12 (18.5 %)	5 (16 %)	7 (21 %)
EDUCATION			
NFE	1 (1.5 %)	1 (3 %)	0 (0 %)
SVE	42 (64,6 %)	16 (52 %)	26 (76 %)
HE or UD	13 (20 %)	9 (29 %)	4 (12 %)
HE or BD	19 (13.8 %)	5 (16 %)	4 (12 %)
EMPLOYMENT STATUS			
employed	47 (72.3 %)	23 (74 %)	24 (71 %)
unemployed	8 (12.3 %)	3 (10 %)	5 (15 %)
retired	10 (15.4 %)	5 (16 %)	5 (15 %)
MARITAL STATUS			
married	37 (56.9 %)	17 (55 %)	20 (59 %)
single	28 (43.1 %)	14 (45 %)	14 (41 %)

NFE - No formal education or below the secondary level; SVE - Secondary vocational education; HE or UD - Higher education or university degree; HE or BD - Higher vocational school degree, typically equivalent to an associate degree or bachelor's degree

Table 2. Distribution of dental anxiety levels among participants

	Frequency	Percent	Valid percent	Cumulative percent
All participants (N = 65)				
no anxiety	25	38.5	38.5	38.5
anxiety	40	61.5	61.5	100
moderate anxiety	25	35.4	35.4	73.8
high anxiety	9	13.8	13.8	87.7
dental phobia	8	12.3	12.3	100
Participants with depression (N = 31)				
no anxiety	5	16.1	16.1	16.1
anxiety	26	83.9	83.9	100
moderate anxiety	13	41.9	41.9	58.1
high anxiety	8	25.8	25.8	83.9
dental phobia	5	16.1	16.1	100
Participants with alcoholism (N = 34)				
no anxiety	20	58.8	58.8	58.8
anxiety	14	41.2	41.2	100
moderate anxiety	10	29.4	29.5	88.2
high anxiety	1	2.9	2.9	91.2
dental phobia	3	8.8	8.8	100

Table 3. Statistical analysis of differences in dental anxiety between participants

	Levene's Test for Equality of Variances		t-test for Equality of Means					95 % Confidence Interval of Diff.	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Difference in dental anxiety prevalence									
Equal variances assumed	0.406	0.526	3.437	63	0.001	0.80171	0.23325	0.3356	1.26782
Equal variancesnot assumed			3.431	61.909	0.001	0.80171	0.23367	0.33459	1.26883
Sex differences in dental anxtety									
Equal variances assumed	0.002	0.964	-1.747	63	0.085	-0.43582	0.24942	-0.93425	0.0626
Equal variances not assumed			-1.751	60.607	0.085	-0.43582	0.24883	-0.93346	0.06182
Age differences in dental anxtety									
Equal variances assumed	1.664	0.202	-1.541	63	0.128	-0.79918	0.5186	-1.83551	0.23715
Equal variances not assumed			-2.831	4.857	0.038	-0.79918	0.28226	-1.53125	-0.06711
Dental anxiety differences by marital status									
Equal variances assumed	0.385	0.537	-0.245	63	0.807	-0.06274	0.25625	-0.57483	0.44934
Equal variances not assumed			-0.242	55.581	0.81	-0.06274	0.25926	-0.58218	0.4567
Dental anxiety differences in unemployed participants compared to employed and retired individuals									
Equal variances assumed	0.585	0.447	1.502	63	0.138	0.57018	0.3797	-1.8859	1.32894
Equal variances not assumed			1.899	11.052	0.084	0.57018	0.30023	-0.09024	1.23059

Table 4. Dental anxiety differences by educational level

Analysis of variance in dental anxiety differences among patients of different educational levels					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.184	3	1.728	1.733	0.170
Within Groups	60.816	61	0.997		
Total	66.000	64			

Discussion

We hypothesized that individuals with a diagnosis of depression and those with a diagnosis of alcohol dependence have an increased prevalence of dental anxiety. Also, that patients with depression would show higher levels of dental anxiety compared to alcohol-dependent patients. As well that factors such as female gender, younger age, single status (unmarried, divorced, widowed, or single), higher educational level, and unemployment were associated with a higher prevalence of dental anxiety. It is important to note that the group of alcohol-dependent participants did not have any other comorbid psychiatric conditions, particularly anxiety-depressive disorders or depression, due to frequent cause-and-effect connections.

In our sample of 65 participants, we found that 40 (61.5 %) had some level of dental anxiety. The majority (35.4 %) had moderate dental anxiety, followed by high anxiety in 13.8 %, and extremely high anxiety or dental phobia in 12.3 %. Previous research indicates that the comorbidity of anxiety and depression is more common than any disorder alone. A large U.S. study found that 58 % of individuals with a history of depression also had an anxiety disorder, and a WHO study indicated that anxiety and depression are the most common coexisting psychological issues in primary healthcare. The high co-occurrence of anxiety and depression suggests that they may share a common cause. Serotonin and norepinephrine neurotransmission disorders are associated with both anxiety and depression, where changes in one system affect the other. Dysregulation of homeostasis between these systems may lead to both conditions. Other theories propose a continuum of disease, where anxiety and depression are seen as different phenotypic expressions of a common neurobiological origin [13]. However, no neurobiological studies have examined these conditions specifically in patients with primary dental anxiety.

In a 2018 literature review, Halonen and associates found a positive association between dental anxiety and depression or mood disorders in 8 of the 16 studies reviewed [13]. Our findings are consistent with previous studies; dental anxiety was found in 83.9 % of depressive patients, with 41.9 % experiencing moderate anxiety, 25.8 % high anxiety, and 16.1 % experiencing extremely high dental anxiety or phobia.

Anxiety disorders are also linked to alcohol misuse. Research by Kaufman and Charney shows that anxiety disorders are often interrelated, with approximately a quarter to half of individuals with an anxiety disorder reporting a history of alcohol or drug abuse [14].

In our study, dental anxiety was found in 14 (41.2 %) of the 34 alcohol-dependent participants. Of those with dental anxiety, 10 (29.4 %) were moderately anxious, while only 1 (2.9 %) had high anxiety. An extremely high level of dental anxiety or dental phobia was present in 3 (8.8 %) participants.

Several studies have reported a significant link between depression and dental anxiety [12-14]. Depression can increase overall anxiety levels, making individuals more prone to dental anxiety. Dental anxiety often coexists with other forms of anxiety and depressive disorders, potentially due to common psychological mechanisms such as heightened sensitivity to stress and impaired emotional regulation.

A 2013 study by Pohjola and associates on a Finnish population showed that individuals with a history of alcohol abuse were more likely to have higher levels of dental anxiety than those without such a history [15]. Conversely, another study by Pohjola and associates in 2014 found a similar result but argued that the association between alcohol use and dental anxiety was not strong [16].

This only further demonstrates that anxiety disorders rarely occur in isolation, with studies showing that over 90 % of individuals with an anxiety disorder have a history of other psychiatric problems [14].

The results of our study confirmed the hypothesis that patients with a diagnosis of depression have higher levels of dental anxiety compared to those with a diagnosis of alcohol dependence, with a t-test value

of t = 3.437, significant at a confidence level of 99 % ($p < 0.01$).

Based on various studies worldwide, we hypothesized that female patients would have a higher prevalence of dental anxiety than male patients. Previous studies have shown a significant prevalence of dental anxiety in women [17-19]. This may be due to women's higher levels of neuroticism, which is positively associated with anxiety [20]. Deogade and associates attributed this to women's greater openness in expressing their anxiety compared to men, who may not be as open due to social stigma, and to women's lower pain tolerance [21].

In our study, there was no statistically significant difference between male and female patients, so we did not find gender differences in dental anxiety within our sample.

Many studies have explored dental anxiety and its relationship with age. Locker and associates suggested that dental anxiety begins in childhood, peaks in early adulthood, and gradually declines with age [22]. Some studies claim that the prevalence of dental anxiety is higher among younger individuals [18,23]. Younger individuals with less dental experience may have more negative perceptions of dental procedures and lower pain tolerance than older patients, who may remain calm and manage their anxiety. Over time and with increased exposure to dental treatments, patients may become more accustomed and experience less anxiety**.** Another study by Locker and associates suggests that the decrease in anxiety with age may be related to aging-related brain changes, an improved ability to cope, and increased exposure to systemic diseases and treatments [24].

In our study, we defined the age threshold as 30 years, as in Croatia, individuals under 30 are considered young. Our hypothesis that younger patients (< 30 years) would have higher levels of dental anxiety than older patients (≥ 30 years) showed no statistical significance, meaning no age differences in dental anxiety were found in our sample. One possible reason for this result may be that participants under 20 were not included, and the 21-30 age group was underrepresented with only 4 participants.

The prevalence of dental anxiety may significantly vary depending on marital status. According to a cross-sectional study by Inoue and associates research indicates that unmarried individuals tend to have higher levels of dental anxiety and are less likely to seek dental care compared to those who are married. This trend is particularly noticeable among men, where unmarried men are less likely to visit a dentist, possibly due to the absence of a partner who often plays a role in promoting regular dental visits and better health behaviors [25].

For women, however, the relationship between marital status and dental anxiety appears to be less pronounced, with studies showing no significant differences in dental anxiety between married and unmarried women. This suggests that marital status may affect dental anxiety differently depending on gender [25]. In our study, no statistically significant difference in dental anxiety was found between patients with a partner and those without a partner.

Regarding the connection between dental anxiety and educational level, research shows conflicting interpretations, each with separate explanations. Some studies suggest that higher educational levels are associated with increased dental anxiety scores, while others claim the opposite-that individuals with lower education levels have higher dental anxiety [20,21,26-29]. Studies indicating that people with lower education levels experience higher dental anxiety argue that individuals with higher education are more willing to confront anxiety and stress. Rather than avoiding situations, they tend to rationalize them, while those with lower education levels more often fear the unknown [20,21]. Increased dental anxiety in a more educated population may be attributed to greater awareness of treatment modalities and possible risks.

Our study showed no difference in dental anxiety among individuals of different educational levels.

Research reveals a significant association between dental anxiety and employment status, with students and the unemployed showing higher anxiety scores than the employed [20,21]. This may also be related to studies indicating that individuals with lower socioeconomic status and irregular monthly income have a higher prevalence of dental anxiety. Unemployed individuals or those working under unstable conditions often experience higher dental anxiety due to financial stress, reduced access to regular dental care, and the high costs of dental treatments. Increased dental anxiety has been observed in communities where dental care is less accessible. Conversely, those with stable employment and dental insurance are more likely to regularly visit a dentist, which can reduce anxiety. While employment status itself may not directly cause anxiety, the surrounding circumstances can influence dental anxiety levels**.** In our sample, we found no statistically significant difference in dental anxiety prevalence among unemployed participants compared to employed and retired individuals.

Conclusion

Based on the results of this study, we can conclude that the prevalence of dental anxiety among psychiatric patients, specifically those diagnosed with depression and alcohol dependence, is elevated overall. Individuals with a diagnosis of depression had statistically signifi-

cantly higher dental anxiety than those diagnosed with alcohol dependence. The association between dental anxiety and sociodemographic characteristics (gender, age, education level, employment status, and partnership status) did not show statistical significance with any characteristic.The etiology of dental anxiety is multifactorial, so there is no single treatment. Proper assessment of the patient and identification of the source and level of anxiety can help dentists develop an appropriate treatment plan. Although anxiety can be triggered by any situation, it is essential to approach each patient individually and with empathy. Sometimes, increased dental anxiety may be observed in various psychiatric disorders, as in this study among depressive patients. In such cases, it is essential to refer the patient to specialists, such as psychologists or psychiatrists, who can further decide on possible treatment. In some cases, teamwork involving a psychologist, psychiatrist, and dentist is required. Due to the strong impact of dental anxiety on psychiatric patients, they may develop a range of oral pathologies, primarily dental caries, and periodontal diseases. Therefore, better education for dentists is needed on psychiatric patients and their frequent association with dental anxiety. This can reduce their stigmatization, accurately diagnose dental anxiety, improve dentist-patient interactions, and increase motivation for maintaining oral hygiene, which positively impacts both oral and overall health.

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Conflict of Interest

None to declare.

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