COMPREHENSIVE APPROACH TO DIAGNOSIS AND PROSTHETIC DENTAL TREATMENT OF PATIENTS WITH MENTAL DISORDERS

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Abstract.
Relevance. An assessment of psychiatric services in the Republic, including in the Bukhara region, was carried out. Problems were identified regarding the diagnosis and dental treatment of psychiatric patients, as this study population required specific approaches due to the presence of anxiety states. At the same time, a sociological, psychological, neurological, and dental evaluation of the cohort was conducted. It was established that unsatisfactory oral hygiene and poor periodontal tissue condition lead to the aggressive progression of carious lesions of the hard dental tissues and their complications. For the provision of qualified medical care to patients with mental disorders, individualized methods were developed for the diagnosis of musculoskeletal pathologies, as well as for the restoration of dental and dentoalveolar defects and deformities using high-quality materials manufactured with digital technology.
Aim of the Study. To improve diagnostic methods and dental treatment of patients with mental disorders through the use of effective materials, advanced techniques, and digital technologies for the fabrication of removable dentures in both outpatient and inpatient settings.
Materials and Methods. The study was based on retrospective and prospective data and included an assessment of the dental status of 850 patients with mental disorders (main group, MG) and 175 patients in the control group (CG) without psychiatric pathology, aged 18 to 70 years. In the entire study cohort, the neuropsychiatric status of patients was examined; the intensity of dental caries and its complications, the need for prosthetic treatment of the jaws, oral hygiene status, periodontal tissue condition, sensitivity of the oral mucosa, and the clinical condition of fabricated dental prostheses were evaluated.
Results. The retrospective analysis revealed high prevalence rates of psychiatric disorders, including schizophrenia – 4,455 cases; epilepsy – 1,790 cases; oligophrenia – 6,606 cases; and other forms of psychoses – 4,849 cases. Among these, 53% of patients were associated with psychiatric disorders due to disability, including 7,921 with group II disability, 609 with group I, and 125 with group III. Patients with mental disorders were characterized by a high intensity of dental caries ($20.67 \pm 0.82^*$), including the following subgroups: schizophrenia – $21.52 \pm 0.98^*$; epilepsy – $22.86 \pm 0.94^*$; oligophrenia – $19.64 \pm 0.78^*$; and other psychiatric disorders – $18.66 \pm 0.98^*$. In contrast, patients in the control group (CG) demonstrated significantly lower values – 11.44 ± 0.62, due to the greater number of carious and extracted teeth and high prosthetic needs ranging from 8.2 ± 0.48 to 9.4 ± 1.4. Periodontal disease prevalence reached 82%, while the risk of chronic oral sepsis was 13.3%. It was established that the application of the new clinical classification of TOR, its methods of identification, and the use of the *Esthesiometer* device

improved diagnostic outcomes and enhanced the effectiveness, timing, and quality of prosthetic treatment, thereby determining the features of an individualized approach for this patient cohort.

Conclusion. Thus, patients with mental disorders are characterized by a high prevalence of dental caries, significant prosthetic treatment needs, and periodontal disease (82%), which is directly associated with an increased risk of chronic oral sepsis. The results of clinical, dental, neuropsychiatric, and sociological studies of oral fluid demonstrate the effectiveness of preventive measures for gingival papilla trauma, provide a highly informative classification of torus and oral mucosal pain sensitivity, and confirm the clinical utility of the *Esthesiometer* device for the diagnosis and treatment of both outpatient and inpatient conditions in patients with mental disorders.

Keywords: psychoneurological disorders, dental caries and its complications, periodontal tissues, dentures, palatal classification, removable prostheses, occlusion.

INTRODUCTION:

The dependence of pathological conditions in the oral cavity on the general state of the body is beyond doubt, while the incidence of caries, periodontitis, and temporomandibular joint disorders is notably high in a number of somatic diseases, including under the influence of harmful factors affecting the human body [1-3]. Several authors point to the possible pathogenetic role of dysfunction of the autonomic and central nervous systems in the formation of pathological processes [4-6]. A correlation has been noted between the occurrence of wedge-shaped dental defects and diseases of the central nervous system. Mental disorders often develop against the background of somatic diseases, metabolic disturbances, endocrine and autonomic dysfunction, organic lesions of the central nervous system, hematological changes, and other systemic conditions [7-9]. However, the impact of neuropsychiatric factors on the dentoalveolar system remains insufficiently studied. Moreover, dentistry often faces challenges in treating psychiatric patients due to unpredictable patient behavior and communication difficulties. In such cases, the psychotherapeutic tasks of the dentist include alleviating anxiety and tension, correcting patients' negative attitudes toward dental treatment, and preventing neurological reactions and iatrogenic complications [10-12]. At the same time, the management of emergency situations and the provision of comprehensive dental care for psychiatric patients remain poorly studied; in practical dentistry, there is a lack of data on centralized dental care for this category of patients. In view of the above, the prevention, diagnosis, and dental treatment of patients with psychiatric disorders remain among the most important issues [13-15].

Aim of the Study. To enhance diagnostic methods and dental treatment of patients with mental disorders by employing effective materials, advanced techniques, and digital technologies for the fabrication of removable dentures in both outpatient and inpatient settings.

MATERIALS AND METHODS.

The present study was based on retrospective and prospective data obtained from the observation of patients and their medical records during 2020–2023. The cohort included individuals with varying degrees of severity of mental disorders who were registered for dispensary follow-up ("D" registration) at the Bukhara Regional Psychiatric Hospital.

For the purpose of conducting a promising study, 850 patients with mental disorders (main group, MG) and 175 patients of the control group (CG) without psychiatric pathology, aged 18–70 years, who voluntarily sought dental care at the clinic, were examined. The assessment included evaluation of the oral cavity depth, attachment of the upper and lower labial and lingual frenula, inspection of the oral mucosa of the lips, cheeks, hard and soft palate, and uvula. Dental arches and periodontal tissues were also studied. In all study groups, the prevalence and intensity of dental caries were assessed using the Decayed-Missing-Filled Teeth Index (DMFT); oral hygiene status was evaluated with the Oral Hygiene Index-Simplified (OHI-S); gingival status was assessed with the Gingival Index (GI, Silness & Löe); and periodontal tissues were examined using the Community Periodontal Index of Treatment Needs (CPITN). A modified risk index (RHOS-M) was applied to determine the relationship between chronic oral infection foci in patients with mental disorders and to assess the impact of oral pathology on the development of chronic oral sepsis. The condition of the temporomandibular joints (TMJs) was evaluated based on the coincidence of a diagnostic triad: presence of pain syndrome; limitation of mouth opening; and internal TMJ disorders, verified by magnetic resonance imaging (MRI). Salivary viscosity was determined using a capillary viscometer, and salivary pH was measured with a portable electronic pH meter [16-18].

Additionally**,** to determine the sensory threshold sensitivity of the palate in accordance with the TOR classification and the alveolar process (utility model patent No. 6592, dated 19.08.2021), the device *"IVN-01 PulpTest-Pro"* was used to assess dental sensitivity. For the objective evaluation of the condition of the jaw bone bases (oral mucosal resilience), an *Esthesiometer* was employed (Figure 1).

Figure 1. "Esthesiometer" in use.

For local anesthesia of the oral cavity during dental procedures, 4% articaine solutions were used (1:200,000 and 1:400,000 Ultracaine DS). Extemporaneously prepared solutions of articaine with a vasoconstrictor (1:400,000 and 1:200,000) and articaine without a vasoconstrictor (Ultracaine D) were also applied [19-22].

For the purpose of prosthetic rehabilitation of patients in need of complete or partial removable plate dentures, a total of 148 dentures were fabricated. Among them, 80 dentures with a soft lining material (UFI Gel H, Germany) and 68 dentures made of *Polident Pink* material were produced for patients with complete edentulism of both jaws. Of these, 44 dentures were manufactured using digital technology, 40 by the traditional method with elements of digital technology, 40 for patients with palatal tori, and 24 partial removable plate dentures were fabricated to prevent trauma to gingival papillae. According to the method of fabrication: Group 1 (traditional method): dentures made of heat-cured acrylic resin (*Villacryl H Plus*, Latvia). Group 2 (subtractive CAD/CAM method): dentures fabricated using *Polident Pink* (Slovenia). Group 3 (additive manufacturing): dentures fabricated using 3D-printing materials (*NextDent*, Netherlands). In all groups, a standard set of acrylic teeth was used.

Statistical Data Processing. Using variational statistical methods, the following parameters were calculated: mean value (M), standard deviation (σ), and standard error of the mean (m). The data were then entered into summary tables, divided into study groups and comparison groups, including values recorded before and after the intervention for each parameter under investigation.

RESULTS AND DISCUSSION

One of the objectives of our study was to examine the epidemiological situation of mental disorders and psychiatric services in the Republic, with particular attention to the Bukhara region. Analysis of the data on psychiatric services in the Republic for 2021 showed the following: the number of physicians on staff was 1,399.25; employed – 1,195.8; physician availability per 10,000 population – 0.25; total visits (thousands) – 1,891,363; of these, 864,717 were disease-related; 25,060 were first-time admissions under D+K registration, including psychoses – 4,001; schizophrenia – 1,766; non-psychotic disorders – 11,008; intellectual disability – 6,327; among them epilepsy – 1,847. In the Bukhara region specifically, the indicators were: 65.5; 64.25; 0.25; 107,853; 1,466; of these, 395 – psychoses, 31 – schizophrenia, 684 – non-psychotic disorders, 252 – intellectual disability, 104 – epilepsy; corresponding rate – 74.2. The data for 2022 across the Republic showed: number of physicians on staff – 1,439; employed – 1,244; physician availability per 10,000 population – 0.26; total visits (thousands) – 2,261,245; of these, 801,503 were disease-related; 24,345 were first-time admissions under D+K registration, including psychoses – 3,635; schizophrenia – 2,056; non-psychotic disorders – 10,333; intellectual disability – 5,995; among them epilepsy – 2,279. In the Bukhara region, the indicators were: 64; 61.5; 0.26; 111,990; 43,478; of these, 1,256 – psychoses, 467 – schizophrenia, 28 – non-psychotic disorders, 459 – intellectual disability, 196 – epilepsy; corresponding rate – 106.

Inpatient psychiatric service: In the Republic in 2021, the number of available hospital beds was 8,094 (22.6 per 100,000 population); the hospitalization rate was 246.3 per 100,000, of which 39.6 were admitted under "D" status; the number of deaths was 80. In the Bukhara region, these indicators were: 497 beds; 24.2 per 100,000; hospitalization rate – 274.8 per 100,000; "D" status – 30.7; number of deaths – 0, respectively. In 2022, across the Republic, the corresponding figures were: 8,107 beds (22.6 per 100,000 population); hospitalization rate – 253.3 per 100,000; of which "D" status – 40.5; number of deaths – 86. In the Bukhara region, these indicators were: 479 beds; 23.8 per 100,000; hospitalization rate – 285.4 per 100,000; "D" status – 32.5; number of deaths – 0, respectively, and others.

Analysis of medical records in the Bukhara region (2021). A total of 17,700 patients under the "D" registry were analyzed, of whom 9,383 were patients with disabilities. Among them, 609 belonged to Group I, 7,921 to Group II, 125 to Group III, and 728 were children and adolescents under the age of 18. Overall, 53.0% of the reviewed cases had disabilities associated with mental disorders. Among women, the respective indicators were as follows: 7,592; 1,975; 793; 2,623; and 2,201. In addition, the analysis revealed that among patients with mental pathologies: 4,455 had schizophrenia, 1,790 had epilepsy, 6,606 had oligophrenia, and 4,849 had other forms of

psychoses. According to our retrospective data (Table 1), a dental examination was carried out among inpatients, taking into account their individual diagnoses in accordance with the existing classification of diseases and health-related problems (WHO, 1996). Of the total number of patients with mental disorders examined, 52.8% were men and 47.2% were women. Epilepsy was more prevalent among men (58.4%), while schizophrenia was more common among women (57.6%). Oligophrenia accounted for 28.8% of all examined cases, regardless of gender. The quantitative and proportional distribution between diagnostic groups (Groups 1, 2, 3, and 4) provided a more complete dataset for statistical analysis and was used as a comparative measure between the main groups. In the control group, men accounted for 56% and women for 44%.

Table 1. Distribution of patients in the study groups by diagnosis and gender

Diagnosis (M/G)	Number of patients in the study groups, n (%)		
	Total	Men	Women
Schizophrenia (M/G-1)	217 (25,5±2,4 %)	92 (42,4±4,8%)	125 (57,6 ± 5,7 %)
Epilepsy (M/G-2)	181 (21,3 ± 2,1 %)	101 (55,,8 ±4,2 %)	80 (44,2 ± 3,7 %)
Oligophrenia (M/G-3)	245 (28,8 ± 3,4 %)	143 (58,4 ± 4,1 %)	102 (41,6 ± 3,4 %)
Other psychoses (M/G-4)	207 (24,3 ± 2,2 %)	113 (54,6 ± 5,4 %)	94 (45,4 ± 4,9 %)
Total M/G	850 (100 %)	449 (52,8 ± 2,3 %)	401 (47,2 ± 2,1 %)
C/G	175 (100%)	98 (56,0 ± 1,6 %)	77 (44,03 ± 2,8 %)
Total patients	1025 (100%)	547 (53,4 ± 3,2%)	478 (46,6 ± 2,8 %)

By age distribution of the examined patients: 18–24 years – 227 (22.1%); 25–34 years – 310 (30.1%); 35–49 years – 329 (32.1%); 50–70 years – 159 (15.5%). Among them, in the control group (C/G): 18–24 years – 22 (12.6%); 25–34 years – 57 (32.6%); 35–49 years – 59 (33.7%); 50–70 years – 37 (21.1%), respectively.

The results of a sociological survey among 50 dentists showed the following: 8 respondents (16.0%) indicated the occurrence of one patient with mental disorders per year; 9 (18.0%) reported one such patient per quarter; 13 (26.0%) reported one such patient per month; 13 (26.0%) reported one such patient per week; 2 (4.0%) reported one such patient per day. Additionally, 5 dentists (10.0%) reported experiencing difficulties in diagnosing mental disorders. Symptoms on the basis of which dentists suspected mental disorders in their patients included: increased anxiety, excessive suspiciousness, exaggeration of symptoms, depressive statements, disbelief in recovery despite positive clinical dynamics, pessimistic attitude toward treatment, increased irritability, inconsistency between clinical presentation and complaints, demand for excessive attention. Actions reported by dentists when suspecting psycho-emotional disturbances or mental disorders in their patients were as follows: 22 (44.0%) – provided dental care, 12 (24.0%) – refused treatment, 5 (10.0%) – referred to other dentists, 1 (2.0%) – referred to a psychiatrist, 10 (20.0%) – attempted to meet the inadequate demands of patients.

When determining the type of attitude toward the disease and forthcoming treatment, as well as in the diagnosis of patients' psycho-emotional state, the Whiteley Index reflected a low probability of hypochondria among patients. A tendency toward aggressive behavior was identified as increased aggressiveness in all examined patients. Positive results were recorded as follows: HADS anxiety index – 3.4 ± 0.31; HADS subscale for anxiety (HADRS) – 2.9 ± 0.26; Whiteley Index – 21.24 ± 0.6; Conflict Personality Index – 19.21 ± 0.72; Assinger's method – 42.55 ± 0.58. It should be noted that, fearing biased attitudes from medical personnel, patients may withhold information from the dentist regarding their psychiatric conditions and the psychotropic medications they are taking. Such omissions are clinically significant, as interactions between psychotropic agents and local anesthetics can provoke emergency conditions. Thus, consideration of the pharmacological interactions of anxiolytics, antidepressants, and neuroleptics with local anesthetic agents guided the selection of local anesthetics for dental procedures. For this purpose, a 4% articaine solution (Ultracain DS 1:200,000 and 1:400,000) was used. Additionally, an articaine solution with vasoconstrictor (1:400,000) was prepared extemporaneously, along with a formulation of articaine without vasoconstrictor (Ultracain D, 1:200,000).

Results of the dental status assessment: In the control group (C/G), the incidence of carious (1.64) and extracted teeth (1.02) was very low, whereas the number of filled teeth (8.42) was significantly higher compared with patients in the main groups (M/G). In all subgroups of the main cohort (M/G-1, M/G-2, M/G-3, M/G-4), the prevalence of dental caries ranged from 96% to 99%, while in the control group this indicator was 78% (Table 2).

Table 2. Condition of Hard Dental Tissues and Dental Arches in Psychiatric Patients.

Diagnosis (M/G)	Caries Intensity in Patients Across Study Groups (M ± n, %).

	CFE	C	F	E
Schizophrenia (M/G-1) n-85/100%	21,52±0,981	9,4±0,75*	2,8±0,46*	9,3±1,4*
Epilepsy (M/G-2) n-85/100%	22,86±0,94*	9,8±0,42*	3,48±0,67*	9,4±0,84*
Oligophrenia (M/G-3) n-105/100%	19,64±0,78*	8,48±0,54*	3,18±0,36*	8,12±0,79*
Other psychoses (M/G-4) n-135/100%	18,86±0,98*	4,42±0,65*	5,62±0,24	8,2±0,48*
Total M/G n-410/100%	20,67±0,82*	8,02±0,56*	3,75±0,44	8,75±0,94*
C/G n-90	11,44±0,62	1,64±0,16	8,42±0,34	1,02±0,32

Analysis of the table shows that the value of the caries intensity index among all patients was almost 2–5 times higher than in the control group (C/G) ($p < 0.05$). The mean DMF index value in all study groups was significantly higher ($p < 0.05$) compared to the C/G. The mean number of extracted teeth was also significantly higher ($p < 0.05$) in the study groups than in the control group. In all examined groups, according to the "M" component of the DMF index, the majority of patients required comprehensive prosthetic treatment (ranging from 65.5% to 98.5%), whereas in the control group only single-tooth prosthetic rehabilitation was necessary. Furthermore, almost no patients with mental disorders were found who did not require prosthetic treatment, while the overall need for prosthetic rehabilitation of both jaws amounted to 75.5%.

During the dental examination, the oral hygiene level, Gingival Index (GI), Community Periodontal Index of Treatment Needs (CPITN) for periodontal tissue assessment, and the index of risk for chronic oral sepsis were determined. Since the mean values of the dental plaque index corresponded to the upper limits of satisfactory oral hygiene, the mean number of carious teeth per patient in this group was 2.02. The mean GI values indicated moderate gingivitis. The average number of teeth with existing apical periodontitis was 2.46. The mean CPITN values across groups ranged from 1.84 to 2.04, and the average number of pathologically mobile teeth per patient in the group was 1.94. The chronic oral sepsis risk index, or generalized periodontitis risk, corresponded to a moderate probability of occurrence (Table 3).

Table 3. Assessment of the Oral Condition in Patients with Mental Disorders Prior to Treatment.

Diagnosis (M/G)	DI-S – Debris Index- Simplified, scores	C– Carious teeth, number	GI – Chronic gingivitis, scores	Apical periodontitis, number	CPITN – Community Periodontal Index of Treatment Needs, scores	Pathologically mobile teeth, number	Risk of chronic oral sepsis
Schizophrenia (M/G-1) n-85/100%	1,1±0,06	1,47±0,12	1,08±0,07	1,3±0,17	1,14±0,07	0,55±0,15	14,16±1,17
Epilepsy (M/G-2) n-85/100%	0,98±0,06	1,9±0,12	1,02±0,09	1,1±0,22	1,08±0,04	0,35±0,12	12,46±1,22
Oligophrenia (M/G-3) n-105/100%	1,4±0,09	2,44±0,44	1,77±0,33	1,7±0,21	1,4±0,04	0,48±0,22	16,24±1,99
Other psychoses (M/G-4) n-135/100%	1,1±0,04	1,08±0,46	1,24±0,07	1,2±0,17	1,48±0,22	0,35±0,98	12,24±1,22

Total M/G n-410/100%	1,1±0,14	1,05±0,22	1,25±0,07	1,3±0,86	1,24±0,44	0,55±0,94	13,24±1,44
C/G n-90	0,1±0,04	0,4±0,16	0,64±0,02	0,2±0,07	0,68±0,45	0,12±0,34	4,54±0,67

It should be noted that during the oral examination of patients with mental disorders, food debris was observed in the interdental spaces and cervical areas, and a putrid odor emanated from the oral cavity. The gingival index (GI) values were as follows: in group M/G-1 – 2.88±0.03*; in group M/G-2 – 2.43±0.08*; in group M/G-3 – 2.78±0.04*; in group M/G-4 – 2.22±0.08*; with an overall mean value of 2.52±0.06* across the study groups. In comparison, the GI value in the control group (C/G) was significantly lower – 0.46±0.04. The differences between the GI values in all M/G groups and the control group were statistically significant ($p<0.05$).

During the survey of psychiatric patients, it was revealed that during inpatient treatment they frequently experienced a sensation of oral dryness (in 86% of cases), and less commonly hypersalivation (in 5%), which occurred after taking medications. According to the results of the analysis of the relationship between the parameters of oral fluid, the GI index, and the intensity of hard dental tissue and periodontal tissue lesions, in group M/G-1 a moderate correlation was observed between the viscosity of oral fluid and the intensity of dental caries ($r=0.57$).

As for the components of the DMF index, it was found that in patients of the study groups (M/G) a moderate correlation was observed between the number of decayed and extracted teeth and the value of oral fluid viscosity ($r=0.51$ and $r=0.56$, respectively), while a weak correlation was observed with the number of filled teeth ($r=0.37$). In M/G-1 and M/G-3, a strong correlation was detected between the pH value and caries intensity ($r=0.62$). Thus, there is a moderate correlation between the number of decayed teeth and the salivary pH value, except in M/G-3 patients ($r=0.56$), whereas for extracted teeth this parameter reached a high level ($r=0.61$). In the control group (C/G), the value of oral fluid viscosity (1.922 ± 0.028 cP) was significantly lower ($p<0.05$) than in the M/G, while the salivary pH in psychiatric patients showed considerable fluctuations.

The intensity of periodontal tissue damage in the examined patients of the study groups (M/G) demonstrated a strong correlation with oral fluid viscosity and the oral hygiene index ($r=0.61$ and $r=0.67$, respectively), while a weak correlation was identified with salivary pH ($r=0.25$). In M/G-3, a strong correlation was observed between oral fluid viscosity and caries intensity ($r=0.61$). In M/G-2, a weak correlation was found between salivary pH and caries intensity ($r=0.17$). This was also true for the number of decayed, filled, and extracted teeth ($r=0.21$, $r=0.11$, and $r=0.15$, respectively). A weak correlation was noted between oral fluid viscosity and caries intensity ($r=0.20$). Similarly, weak correlations were found for all components of the DMF index, with correlation values for decayed, filled, and extracted teeth being $r=0.21$, $r=0.14$, and $r=0.19$, respectively. There is also a moderate correlation between the oral hygiene efficiency index and caries intensity ($r=0.57$). Similarly, a moderate correlation was observed with the number of decayed and extracted teeth ($r=0.59$ and $r=0.56$, respectively), while a weak correlation was found for filled teeth ($r=0.24$). Gingival bleeding and tooth mobility were reported by many examined patients. Thus, in M/G-1, M/G-2, M/G-3, and M/G-4, gingival bleeding and tooth mobility were observed in 36% to 68% of cases, whereas in the control group (C/G), tooth mobility was recorded in only 4% of patients. On average, in M/G, the distribution by CPI codes was as follows: CPI 0 – 10.9%; CPI 1 – 14.5%; CPI 2 – 26.5%; CPI 3 – 22.5%; CPI 4 – 6.5%; and CPI 5 – 19.25%. According to the results of M/G-1 and M/G-2, the prevalence of periodontal disease was 88–92%, respectively. Most frequently, 25.7% of patients in these groups presented with periodontal pockets of 4–5 mm (mean 1.54 sextants), which is 2.2 times higher compared to other groups. The prevalence of periodontal pockets ≥6 mm was 11.7%. In contrast, the prevalence of periodontal disease in C/G was 56%. Gingival bleeding was most frequently observed in 18.7% of examined patients, with a mean bleeding intensity of 1.32. Dental calculus was found in an average of 1.24 sextants, with a prevalence of 23.6%. The mean number of sextants with periodontal pockets of 4–5 mm and ≥6 mm was 0.44 and 0.06, respectively. It should also be noted that in the C/G group, only 0.06 excluded sextants were identified, while a healthy periodontium was determined in 1.98 sextants.

In patients of M/G-1 and M/G-3, a strong correlation was found between salivary pH and caries intensity ($r=0.62$). Thus, a moderate correlation was observed between the number of decayed teeth and salivary pH values, except in O/G-3, where this relationship reached $r=0.56$. For extracted teeth, the correlation was high ($r=0.61$), while for filled teeth, a weak correlation was noted ($r=0.24$). The intensity of periodontal tissue damage in the examined patients showed a low correlation with salivary viscosity and pH values ($r=0.31$ and $r=0.74$, respectively), and a moderate correlation with the oral hygiene efficiency index ($r=0.59$).

Assessment of the prevalence of temporomandibular joint (TMJ) pathology in psychiatric patients according to psychopathological and nosological classification (ICD-10).

The main complaint among patients was pain, reported by 86.6% of the M/G group, including 96.5% of M/G-1, 89.4% of M/G-2, 94.3% of M/G-3, and 72.6% of M/G-4 patients, whereas in the control group (C/G) this was noted in 24.4% of cases. A total of 175 patients (49.3%) reported pain syndromes, distributed as follows: 57.3% in M/G-1, 55.5% in M/G-2, 46.1% in M/G-3, and 38.8% in M/G-4. Complaints of restricted mouth opening were observed in 150 patients (42.2%), including 53.9% of M/G-2, 46.3% of M/G-1, 42.2% of M/G-3, and 29.6% of M/G-4. Joint noises were reported in 58.8% of M/G patients, with the highest frequency in M/G-3 (81.8%),

followed by M/G-2 (76.3%) and M/G-1 (43.9%). Most patients (255; 62.2%) described the pain as "dull," "pulling," "pressing," "aching," and constant, while 189 patients (46.09%) experienced "acute" and "shooting" pain. In 200 patients (48.8%), pain was localized directly in the temporomandibular joint (TMJ) and parotid region, whereas in 178 patients (43.41%) it radiated from the primary site of localization to the temporal, cervical, occipital, infraorbital, and posterior regions, as well as to the maxilla and mandible. Furthermore, 89 patients (21.7%) reported pain migration from one area to another.

Analysis of the results showed that the sensory thresholds in patients of M/G-1 and M/G-3 were closer to those of the control group (C/G) ($p > 0.05$). In contrast, patients in M/G-2 and M/G-4 demonstrated significantly higher sensitivity thresholds, exceeding the control values by 1.5–2 times ($p < 0.05$). The sensitivity threshold in M/G-2 and M/G-4 patients was higher compared with M/G-1 and M/G-3 ($p < 0.05$). Furthermore, the pain threshold in the examined patients was significantly lower ($p < 0.05$) than in the other M/G subgroups.

As for the endurance threshold, in the control group (C/G) this indicator was significantly lower than in patients of M/G-1, M/G-2, and M/G-4 ($p < 0.05$). At the same time, the highest values were observed in M/G-2 and M/G-1, where the endurance threshold was significantly higher compared with patients in M/G-3 and M/G-4 ($p < 0.05$).

To assess potential changes in pain sensitivity thresholds in patients with signs of depression, the thresholds of electrical excitability of the pulp of intact teeth were measured. When determining the threshold of electrical excitability of the dental pulp (μA) in the maxilla and mandible, the following values were obtained: the mean value for the overall study group (M/G) was 4.95 ± 0.28, while in M/G-1 it was 5.95 ± 0.88; M/G-2 – 6.68 ± 0.26; M/G-3 – 3.56 ± 0.46; M/G-4 – 3.86 ± 0.28; and in the control group (C/G) – 2.6 ± 0.22. At the same time, for the maxilla, the following values were obtained: 4.92 ± 0.28; 6.11 ± 0.28; 6.98 ± 0.46; 4.46 ± 0.18; 4.98 ± 0.88; and 2.9 ± 0.42, respectively. For the mandible, these values were: 3.98 ± 0.48; 5.44 ± 0.78; 6.02 ± 0.48; 4.23 ± 0.38; 3.48 ± 0.48; and 2.1 ± 0.22, respectively.

For the fabrication of complete removable plate dentures and partial removable plate dentures on both jaws, 80 dentures with a soft lining on the maxilla and 68 dentures on the mandible made of *PolidentPink* material were subjected to clinical and laboratory studies. These included a thorough examination of the anatomy of the torus and the functional state of the oral mucosa by measuring its pain sensitivity, as well as the implementation of a fine system of torus isolation on the removable plate denture. Torus isolation was carried out using the method of N.S. Ruzuddinov. At the same time, for patients with complete edentulism and torus types II and III according to the clinical classification, dentures with a double-layer base were fabricated, whereas for patients with torus type I, dentures were fabricated from acrylic plastics (Figure 2, 3, 4, 5).

Figure 2. Finished silicone along the outlined border in the isolation of the denture base.

Figure 3. Finished acrylic partial removable denture with a silicone plate.

Figure 4. Finished partial removable denture after removal of the silicone plate.

Figure 5. Partial removable denture with pronounced dentogingival overgrowths on the surface of the denture base.

In the initial days of using removable dentures with a soft liner, patients experienced anxiety in anticipation of pain, discomfort, and irritability. Within 10–25 days, patients fully adapted, successfully used the dentures, and reported no complaints, noting improved denture retention, absence of pain beneath the dentures, although some remained cautious regarding the possible onset of pain or potential denture fractures. Clinical evaluations over time, following the delivery of complete removable acrylic dentures, demonstrated good retention and stabilization after 1 week, 1 month, and 6 months. Significant improvement in retention and stabilization was observed in maxillary and mandibular dentures compared with the traditional dentures previously used by patients. All patients were satisfied with the outcomes of prosthetic treatment (p < 0.001). The distribution of satisfaction with complete removable acrylic dentures was as follows: highly satisfactory in 55.5% of cases, satisfactory in 33.5%, and unsatisfactory in 11% of cases.

The choice of anesthesia method depended on the scope, invasiveness, and anticipated pain intensity of the upcoming dental intervention, as well as the use of psychotropic medications by the patients. Preparation of hard dental tissues and tooth depulpation in the maxilla were performed under infiltration anesthesia using 4% articaine solution with a vasoconstrictor (epinephrine at a concentration of 1:200,000). The effectiveness rate was $87.55 \pm 1.27\%$, with an average intervention duration of 31.52 ± 0.79 minutes. In patients presenting with signs of aggression, the effectiveness was $87.09 \pm 0.79\%$, with a mean duration of 32.2 ± 0.59 minutes. In patients with anxiety, effectiveness reached $93.21 \pm 0.72\%$, with a duration of 33.03 ± 0.57 minutes. Among patients with depressive symptoms, the effectiveness was $89.00 \pm 2.06\%$, and the duration of procedures averaged 36.00 ± 1.24 minutes. In patients with hypochondriacal features, similar results were observed.

The results of evaluating the effectiveness of removable dentures in patients using digital technologies demonstrated that Polident Pink, used for milling in the CAD/CAM system, showed the highest performance across all types of testing. In contrast, Villacryl H Plus acrylic resin, applied in conventional removable prosthetics, demonstrated the lowest values. NextDent Adventure 3D materials for jet 3D printing exhibited intermediate results between Polident Pink and Villacryl H Plus.

Analysis of the treatment outcomes demonstrated that the caries intensity index across all M/G groups reached nearly 30; this value was up to 60% lower before treatment ($16.57 \pm 0.42*$). Moreover, the effectiveness of comprehensive treatment was significantly higher compared to the C/G group (8.04 ± 0.64; $p<0.05$). The mean DMF index in all examined groups was significantly higher ($p<0.05$) than in the C/G group. Positive dynamics were also observed in all study groups following prosthetic rehabilitation.

Oral examination revealed improvements in **o**ral hygiene level**,** gingival index (GI)**,** CPITN index, and the risk index of chronic oral sepsis or periodontal tissue inflammation after treatment and prosthetic rehabilitation, with overall positive outcomes. Following therapeutic and preventive interventions among patients with mental

disorders, it was established that during general inpatient treatment, their periodontal status improved in 65% of cases, while excessive salivation was less frequently observed (17%), a condition usually associated with medication intake.

In the control group (C/G), the value of oral fluid viscosity (1.122 ± 0.128 cP) was significantly lower ($p < 0.05$) compared to the groups with mental disorders. At the same time, the salivary pH values demonstrated considerable fluctuations. The condition of periodontal tissues in patients with mental disorders after treatment showed a decrease in gingival bleeding and tooth mobility. In M/G groups 1, 2, 3, and 4, gingival bleeding and tooth mobility were observed in 36% to 68% of cases, whereas in the control group (C/G), tooth mobility was noted in only 1.18% of cases.

Analysis of the obtained data shows that among the groups of patients with mental disorders, individuals with low sensitivity thresholds were less frequently observed ($p < 0.05$), with the exception of patients in M/G-3 and M/G-4. Patients with medium and high sensitivity thresholds were significantly more frequently observed in the control group (C/G) ($p < 0.05$) compared to those with low sensitivity thresholds.

CONCLUSIONS

1. In the Bukhara region, the morbidity rates for mental disorders were established at 17,700 cases, including schizophrenia – 4,455 cases; epilepsy – 1,790 cases; oligophrenia – 6,606 cases; and other forms of psychoses – 4,849 cases. Patients with mental disorders were also characterized by high caries intensity ($20.67 \pm 0.82^*$), including patients diagnosed with schizophrenia – $21.52 \pm 0.98^*$; epilepsy – $22.86 \pm 0.94^*$; oligophrenia – $19.64 \pm 0.78^*$; and other mental disorders – $18.66 \pm 0.98^*$.

2. Based on a sociological survey of dentists, it was revealed that 100% of respondents admitted patients with mental disorders: 16% reported 8 such patients per year, 18% – 9 patients per quarter, 26% – 26 patients per month or week, and 4% – 2 patients per day. Diagnostic difficulties were reported by 10% (5 dentists). In cases of suspected mental illness, 44% of respondents reported that they would provide dental treatment, 24% would refuse treatment, 10% would refer to another dentist, 2% would refer to a psychiatrist, and 20% would meet the patients' inadequate treatment demands.

3. The oral health status of patients with mental disorders was characterized by a high prevalence of periodontal diseases – 82%; high risk of chronic oral sepsis – 13.3%; unsatisfactory oral hygiene status; DI-S plaque index – 1.1 ± 0.14 points; GI (chronic gingivitis) – $1.25 \pm 0.07^*$; apical periodontitis – 1.3 ± 0.86; CPITN (chronic periodontitis) – $1.24 \pm 0.44^*$; and pathological tooth mobility – $0.55 \pm 0.94^*$. All of these findings were significantly different compared with the control group.

4. The obtained sociological, psychological, dental, and clinical data confirm the high prevalence of dental pathology, particularly temporomandibular joint (TMJ) disorders (86.6%) in patients with mental disorders. This indicates the presence of TMJ dysfunction in more than 60–65% of patients, developing against the background of psychopathic symptoms or their examination. In combination with the effectiveness of psychopharmacotherapy in alleviating TMJ dysfunction symptoms in some patients, these results suggest a specific contribution of mental disorders to the pathogenesis of TMJ diseases.

5. The effectiveness of infiltration anesthesia in the maxilla with 4% articaine solution and a vasoconstrictor at 1:200,000 was 88.32% in patients; with 4% articaine and adrenaline at 1:400,000 – 86%. In the mandible (anterior teeth), it was 87.9%, and with 4% articaine and adrenaline at 1:400,000 – 86.4%. These results provide evidence for the choice of effective local anesthesia in dental outpatient treatment of patients with mental disorders.

6. The use of a new clinical classification of torus, methods of its isolation, application of the novel device "Esthesiometer" for determining the compliance of the oral mucosa, considering the physico-mechanical properties of materials, along with a modified method of prosthesis fabrication using digital technologies, demonstrated improved efficiency, quality of prostheses, their material properties, and clinical characteristics in patients with mental disorders.

REFERENCES

1. Earar, K., Palivan, C. C. M., Dumitru, I. F., Anca, N., & Jaradat, M. A. (2020). Prosthetic rehabilitation of patients with mental and medicines disabilities. *Romanian Journal of Oral Rehabilitation*, *12*(3).

2. Axmadovich, S. A., Amrulloevich, G. S., Dilmurodjonovich, O. J., Sotvoldievich, J. R., & Sunnatulloevna, G. S. (8(3) 2025,). Achieving effectiveness by improving methods of using local phytopreparations in the treatment of inflammatory lesions of periodontal tissues. *International Journal of Innovative Research and Scientific Studies*, 4691-4699. https://doi.org/10.53894/ijirss.v8i3.7587

3. Ebadollahi Novin, M. (2024). *A multidisciplinary approach in the planing of complex oral rehabilitation* (Doctoral dissertation, University of Zagreb. School of Dental Medicine).

4. Amrulloyevich, G. S., Rahimovna, M. M. D., Qahramonovich, N. U. B., Samandarovna, M. N., Axmadovich, S. A., & Sunnatulloyevna, G. S. (2024). Grounding And Solutions of Ecological Sustainability, Stomatology, And Human Health Problems in Scientific-Practical-Experiments. *Journal of Ecohumanism*, *3*(4), 886-897. https://doi.org/10.62754/joe.v3i4.3614

5.   Schnabl, D., Guarda, A., Guarda, M., von Spreckelsen, L. M. I., Riedmann, M., Steiner, R., & Dumfahrt, H. (2019). Dental treatment under general anesthesia in adults with special needs at the University Hospital of Dental Prosthetics and Restorative Dentistry of Innsbruck, Austria: a retrospective study of 12 years. *Clinical oral investigations*, *23*(11), 4157-4162.

6.   Xen D.N., Djumayev Z.F., Jambilov R.S., Gafforov S.A., Sobirov A.A., Ruziddinov N.S., Gafforova S.S. (2024). Justification of the effectiveness of various methods of manufacturing dentures and improving the quality of treatment of patients with removable dentures using digital technologies. African Journal of Biomedical Research. Vol. 27(4s), 2671-2679. https://doi.org/10.53555/AJBR.v27i4S.3665

7.   Dios, P. D., & Kumar, N. (Eds.). (2021). *A practical approach to special care in dentistry*. John Wiley & Sons.

8.   Alijon, S., Sunnatullo, G., Nurmukhamet, R., Raykhon, P., Ravshanbek, J., Kalamkas, R., ... & Sevara, G. (2025). Justification for the physiological isolation of the torus based on the pain sensitivity of the oral mucosa. In *BIO Web of Conferences* (Vol. 152, p. 01008). EDP Sciences. https://doi.org/10.1051/bioconf/202515201008

9.   Stanescu, C., Forna, D. A., Forna, N. C., Vacaru-Carnaru, M., & Condratovici, A. P. (2025). Managing oral rehabilitation in patients with anxiety disorders under benzodiazepine therapy. *Romanian Journal of Oral Rehabilitation*, *17*(2).

10.   Gafforova S.S., Akhrarova Sh.I., Gafforov S.A., Sobirov A.A., Pulatova R.S. (2024). Improving dental treatment and preventive methods aimed at improving the condition of periodontal tissues and oral mucosa in patients with AIDS. African Journal of Biomedical Research. Vol. 27(4s), 3083 – 3091. https://doi.org/10.53555/AJBR.v27i4S.3443

11. Kudsi, Z., Fenlon, M. R., Johal, A., & Baysan, A. (2020). Assessment of psychological disturbance in patients with tooth loss: A systematic review of assessment tools. *Journal of prosthodontics*, *29*(3), 193-200.

12. Tukhtakhojaevna, N. N., Amrulloevich, G. S., Sotvoldievich, J. R., Sunnatulloevna, G. S., & Axmadovich, S. A. (8(x) 2025,). Comparative analysis of the oral cavity microflora state in various degrees of inflammatory conditions of periodontal tissues using comprehensive studies. *International Journal of Innovative Research and Scientific Studies*, 1161-1168. https://doi.org/10.53894/ijirss.v8i2.5420

13.   Rangel, J. P. A., Borges, A. F. M., Leão, L. O., de Mattos de Araujo, B. M., Stechman Neto, J., Guariza-Filho, O., ... & Taveira, K. V. M. (2024). Oral health of people with emotional disorders: a systematic review and meta-analysis. *Clinical Oral Investigations*, *28*(5), 274.

14.   Akhmedova G.Sh., Radjabov N.M., Dalimova Sh.K., Gafforov S.A., Sobirov A.A., Abduxoliqov S.F. (2025). Optimization Methods Of Using Local Herbal Preparations In The Treatment Of Severe Chronic Generalized Periodontitis. African Journal of Biomedical Research. Vol. 28(4s), 110-117. https://doi.org/10.53555/AJBR.v28i4S.8305

15.   Stefanac, S. J., & Nesbit, S. P. (2023). *Diagnosis and Treatment Planning in Dentistry-E-Book: Diagnosis and Treatment Planning in Dentistry-E-Book*. Elsevier Health Sciences.

16.   Axmadovich, S. A., Amrulloyevich, G. S., Fakhriddin ogli, A. S., Sherali ogli, X. M., Sotvoldiyevich, D. R., Tuhtakhodjaevna, N. N., & Dilmurodjon ogli, O. J. (2025). Scientific and practical justification of alternative methods for using the phytopreparations Hemostat and Clove Essential Oil in the treatment of severe chronic generalized periodontitis. *Edelweiss Applied Science and Technology*, *9*(7), 1737-1747. https://doi.org/10.55214/2576-8484.v9i7.9007

17.   Duong, H. Y., Roccuzzo, A., Stähli, A., Salvi, G. E., Lang, N. P., & Sculean, A. (2022). Oral health-related quality of life of patients rehabilitated with fixed and removable implant-supported dental prostheses. *Periodontology 2000*, *88*(1), 201-237.

18.   Axmadovich, S. A., Amrulloevich, G. S., Tukhtakhujaevna, N. N., Sotvoldievich, D. R., Xaldarovna, Y. F., Matlubovich, R. N., ... & Nusratovich, I. F. (2025). Clinical-functional and immune-microbiological features of the oral cavity in children and adolescents with chronic forms of gingivitis. *Edelweiss Applied Science and Technology*, *9*(5), 3371-3382. https://doi.org/10.55214/25768484.v9i5.7708

19.   Nitschke, I., Wendland, A., Weber, S., Jockusch, J., Lethaus, B., & Hahnel, S. (2021). Considerations for the prosthetic dental treatment of geriatric patients in Germany. *Journal of clinical medicine*, *10*(2), 304.

20.   Shamsiyeva, M. O., Gafforov, S. A., & Sobirov, A. A. Basing the formation of pathologies of the oral cavity in children and adolescents with cerebral palsy with the help of clinical and laboratory studies. Sciences of Europe, 2024, 144, 40-45. https://doi.org/10.5281/zenodo.12739930

21.   Mosaddad, S. A., Talebi, S., Keyhan, S. O., Fallahi, H. R., Darvishi, M., Aghili, S. S., ... & Fathi, A. (2024). Dental implant considerations in patients with systemic diseases: An updated comprehensive review. *Journal of Oral Rehabilitation*, *51*(7), 1250-1302.

22.   Gafforov S. A., Shamsiyeva M.O., Sobirov A. A., Akhrarova Sh. I. Biochemical characteristics of oral cavity pathology in children and adolescents with cerebral palsy. Sciences of Europe, 144, 32-39. https://doi.org/10.5281/zenodo.12739920