

ORIGINAL RESEARCH ARTICLE

Association of tumor localization and treatment stage with anxiety and depression in patients with malignant tumors of the maxillofacial region

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Citation: Belikov O, Roshchuk O, Belikova N, *et al.* Association of tumor localization and treatment stage with anxiety and depression in patients with malignant tumors of the maxillofacial region. *Eurasian J Med Oncol.*
doi: 10.36922/EJMO026240274

Received: June 13, 2026

Revised: August 2, 2026

Accepted: August 21, 2026

Published online: August 28, 2026

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Abstract

Introduction: Despite advances in psycho-oncology, limited evidence is available regarding changes in the psychoemotional status of patients with malignant tumors of the maxillofacial region across different stages of treatment and rehabilitation, particularly in relation to tumor localization and the severity of functional and aesthetic impairments.

Objective: This study aimed to evaluate the dynamics of anxiety and depression in patients with malignant tumors of the maxillofacial region at different stages of treatment and rehabilitation and to determine their association with tumor localization and the severity of anatomical, functional, and aesthetic impairments.

Methods: A total of 85 patients with malignant tumors of the maxillofacial region were enrolled. Anxiety and depression were assessed using a modified Hospital Anxiety and Depression Scale (HADS), and an Integral Psychoemotional Index (IPEI) was calculated at hospitalization, during the preoperative period, and after surgery. Data were analyzed using appropriate statistical methods.

Results: Anxiety, depression, and IPEI values progressively decreased throughout treatment, from 12.4, 10.8, and 2.31 at hospitalization to 6.7, 5.4, and 1.28 in the postoperative period, respectively ($p < 0.01$). Tumor localization was significantly associated with psychoemotional status. The highest IPEI values were observed in patients with tumors of the nasal cavity and maxillary sinus, whereas the lowest values were recorded in patients with hard and soft palate tumors ($p < 0.01$). Anxiety and depression levels were significantly higher in women and younger patients.

Conclusion: Patients with malignant tumors of the maxillofacial region demonstrated progressively lower anxiety and depression levels during treatment and rehabilitation. Psychoemotional disturbances were associated with tumor

localization, with the highest burden observed in patients with tumors affecting the nasal cavity and maxillary sinus.

Keywords: Anxiety; Depression; Maxillofacial neoplasms; Head and neck cancer; Rehabilitation

1. Introduction

Head and neck cancers, including malignant tumors of the maxillofacial region, remain a major global public health challenge due to their high incidence, substantial mortality, and profound impact on functional status and quality of life. According to GLOBOCAN 2020 estimates, head and neck malignancies account for more than 930,000 new cases and approximately 470,000 deaths annually worldwide, with the global burden projected to increase substantially by 2050 due to population growth, aging, and persistent exposure to established risk factors. Recent epidemiological projections indicate a substantial rise in the incidence of head and neck cancer by 2050, particularly in low- and middle-income countries, highlighting the growing need for effective treatment and comprehensive rehabilitation strategies.¹⁻³

The clinical significance of tumors affecting the maxillofacial region extends beyond oncological outcomes. These neoplasms often involve anatomical structures responsible for essential physiological and social functions, including mastication, swallowing, speech, breathing, and facial expression. Consequently, patients frequently experience not only physical impairment but also considerable psychological distress resulting from facial disfigurement, altered appearance, impaired communication, and reduced social participation. Such consequences may substantially affect emotional well-being, social functioning, and overall quality of life.⁴⁻⁶

In recent years, increasing attention has been directed toward patient-reported outcomes and survivorship issues in head and neck oncology. Systematic reviews have consistently demonstrated that survivors of head and neck cancer experience significant deterioration in oral health-related quality of life, functional performance, and psychosocial well-being.⁴⁻⁶ Persistent difficulties with oral function, speech, nutrition, and social interaction may remain long after completion of treatment, contributing to prolonged emotional burden and reduced life satisfaction. Furthermore, poor oral health has been associated not only with impaired quality of life but also with unfavorable clinical outcomes and reduced survival.⁷

Among the psychological consequences of cancer

diagnosis and treatment, anxiety and depression are particularly prevalent. Patients with maxillofacial tumors are exposed to multiple stressors throughout the treatment trajectory, including uncertainty regarding prognosis, fear of surgery, concerns about facial appearance, impaired function, and potential social stigmatization. Recent systematic reviews and meta-analyses have reported high rates of anxiety and depressive symptoms among patients with head and neck cancer, especially during active treatment and the early rehabilitation period. These psychological disturbances may adversely affect treatment adherence, rehabilitation outcomes, quality of life, and long-term recovery.⁸⁻¹¹

The severity and dynamics of psychological distress are not uniform across patients and may vary according to several clinical factors. Tumor localization has been identified as a major determinant of psychosocial adaptation because lesions affecting visible facial structures or critical functional areas are frequently associated with greater emotional burden. Similarly, different stages of treatment and rehabilitation may be characterized by distinct psychological challenges.^{12,13} The period immediately following diagnosis is often accompanied by uncertainty and fear, whereas the preoperative stage is associated with anticipatory anxiety related to surgical intervention and its consequences. During the postoperative and rehabilitation phases, patients must adapt to functional limitations, altered appearance, and changes in social and professional roles.¹⁴⁻¹⁶

Contemporary survivorship models emphasize that successful cancer treatment should be evaluated not only by oncological outcomes but also by the preservation of physical, psychological, and social functioning. Early identification of anxiety and depressive symptoms may improve adaptation, treatment adherence, and rehabilitation outcomes.¹⁵⁻¹⁷

Despite growing interest in psycho-oncology, relatively few studies have examined the dynamics of anxiety and depression in patients with maxillofacial tumors across different stages of treatment and rehabilitation while simultaneously considering the association of tumor localization with the severity of functional and aesthetic impairment.¹⁷ A better understanding of these relationships

may improve individualized rehabilitation planning and optimize multidisciplinary support strategies for this patient population.

Therefore, the aim of this study was to evaluate the dynamics of anxiety and depression in patients with malignant tumors of the maxillofacial region at different stages of treatment and rehabilitation and to determine their association with tumor localization and the severity of anatomical, functional, and aesthetic impairments.

2. Materials and methods

2.1. Study design

This prospective multicenter observational study evaluated the prevalence and dynamics of anxiety and depressive symptoms in patients with malignant tumors of the maxillofacial region at different stages of treatment and rehabilitation.

2.2. Study sample

Consecutive eligible patients were recruited between January 2021 and December 2024 from three regional oncology centers located in the Chernivtsi, Ivano-Frankivsk, and Ternopil regions of western Ukraine. A total of 85 patients with malignant tumors of the maxillofacial region were enrolled and underwent assessments at three predefined stages: hospital admission, the preoperative period, and the postoperative rehabilitation period. The demographic and clinical characteristics of the study population are summarized in Table 1.

Table 1. Demographic and clinical characteristics of the study population (*n* = 85)

Characteristic	<i>n</i> (%)
Alveolar process	34 (40.0)
Nasal cavity and maxillary sinus	27 (31.8)
Hard and soft palate	24 (28.2)
Men	52 (61.2)
Women	33 (38.8)
Age, years	54.6 ± 11.8

2.3. Inclusion and exclusion criteria

Inclusion criteria of this study are as follows:

- (i) morphologically confirmed malignant process in the maxillofacial region;
- (ii) age 30–75 years;
- (iii) patients undergoing hospitalization, surgery,

- postoperative rehabilitation, radiotherapy, or chemoradiotherapy;
- (iv) absence of severe mental disorders; and
- (v) written informed consent.

Exclusion criteria of the present study are as follows:

- (i) metastatic lesions of the central nervous system;
- (ii) severe cognitive impairment; and
- (iii) history of severe mental disorders.

2.4. Clinical assessment and study stages

All participants underwent a comprehensive clinical examination, including assessment of speech, mastication, swallowing, breathing, facial deformity, pain intensity, and dental and oncological history.

Psychoemotional status was assessed using an adapted clinical method of assessing psychoemotional reactions in patients with maxillofacial pathology was used, which takes into account the anatomical, functional, aesthetic, and social consequences of treatment.¹⁸

The following were assessed: (i) level of anxiety; (ii) depressive symptoms; (iii) affective lability; and (iv) social maladjustment.

Based on the clinical and anatomical characteristics and the severity of anatomical and functional impairment, patients were classified into three clinical severity categories:

- (i) Severe – damage to the nasal cavity and maxillary sinus (characterized by severe anatomical defects, breathing and speech disorders, significant facial asymmetry);
- (ii) Moderate – damage to the upper jaw and alveolar process (facial deformation, chewing and articulation disorders, moderate functional disorders);
- (iii) Mild – damage to the hard and soft palate (mainly functional speech and swallowing disorders without gross deformation of the facial skeleton).

The study was conducted in three stages of treatment: (i) upon admission (before treatment); (ii) in the preoperative stage (1–2 days before surgery); and (iii) in the postoperative rehabilitation stage (14–21 days after surgery).

2.5. Assessment of psychoemotional status

Psychoemotional status was evaluated using two complementary approaches. First, an adapted clinical method for assessing psychoemotional reactions in patients with maxillofacial pathology was applied. The Integral Psychoemotional Index (IPEI), previously referred to as the Integral Indicator of Psychoemotional Changes (IIPC) in earlier publications,¹⁸ was used to assess the anatomical,

functional, aesthetic, and social consequences of treatment and has previously been used in patients with maxillofacial diseases.

The assessment included the evaluation of anxiety, depressive symptoms, affective lability, and social maladaptation. Based on these clinical characteristics, an IPEI was calculated to provide a comprehensive measure of psychoemotional burden. Higher IPEI values indicated greater psychoemotional burden. According to the total score, psychoemotional burden was classified as: mild (0–4 points), moderate (5–12 points),

or severe (13–21 points).

In addition, anxiety and depressive symptoms were independently assessed using the Hospital Anxiety and Depression Scale (HADS), which consists of two seven-item subscales evaluating anxiety (HADS-A) and depression (HADS-D).^{19,20} Scores of 0–7 indicated normal findings, 8–10 indicated borderline (subclinical) symptoms, and ≥11 indicated clinically significant anxiety or depression.

2.6. Statistical analysis

Statistical analyses were performed using STATISTICA 10.0 (StatSoft Inc., USA) and SPSS Statistics version 23.0 (IBM Corp., Armonk, NY, USA). Data distribution was assessed using the Shapiro–Wilk test. Continuous variables are presented as mean ± standard deviation (SD) or median with interquartile range (IQR), depending on data distribution, whereas categorical variables are expressed as frequencies and percentages.

For comparisons between two independent groups, Student's *t*-test or the Mann–Whitney *U* test was applied as appropriate. Comparisons among three independent groups were performed using the Kruskal–Wallis test. Changes in psychoemotional indicators across the three treatment stages were analyzed using the Friedman ANOVA for repeated measures, followed by Wilcoxon signed-rank tests for pairwise comparisons when appropriate. Associations between categorical variables were evaluated using the χ^2 test. Correlations between clinical and psychoemotional variables were assessed using Pearson's correlation coefficient. A two-sided *p*-value < 0.05 was considered statistically significant. Ninety-five percent confidence intervals (95% CI) were calculated where appropriate.

2.7. Ethical considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. The study protocol was reviewed and approved by the Bioethics Committee of Bukovinian State Medical University (Protocol No.

6, February 18, 2021). Written informed consent was obtained from all participants prior to enrollment.

3. Results

The HADS assessment demonstrated significant changes in anxiety and depression scores across the different stages of treatment, with the highest values observed at hospital admission and a progressive reduction during the preoperative and postoperative rehabilitation periods.

Overall analysis of psychoemotional status demonstrated that the most pronounced disturbances were observed at hospital admission. A high level of anxiety was noted in 72.9% of patients and depressive symptoms in 64.7%.

At the preoperative stage, there was a significant decrease in psychoemotional tension, which was expressed in a decrease in the frequency of high anxiety to 58.8% (*p* < 0.05) and depression to 49.4% (*p* < 0.05). During the postoperative rehabilitation period, the lowest levels of psychoemotional disturbance were observed in only 32.9% of patients, and depression in 22.4% (*p* < 0.01). The proportions of patients with clinically significant anxiety and depression are presented below, whereas the corresponding mean HADS scores are summarized in Table 2.

Table 2. Dynamics of indicators of the psychoemotional state of patients at different stages of treatment (*n* = 85)

Indication	Stage of admission	Preoperative stage	Postoperative (rehabilitation) stage
Anxiety level (points)	12.4 ± 2.6	9.2 ± 2.1*	6.7 ± 1.9**
Depression level (points)	10.8 ± 2.3	8.3 ± 2.0*	5.4 ± 1.6**
IPEI (c.u.)	2.31 ± 0.09	1.87 ± 0.08*	1.28 ± 0.06**

Notes: Overall differences across the three treatment stages were evaluated using the Friedman ANOVA. Pairwise comparisons were performed using the Wilcoxon signed-rank test. **p* < 0.05 versus the admission stage; ***p* < 0.01 versus the preoperative stage.

As shown in Table 2, anxiety, depression, and overall psychoemotional burden progressively decreased throughout treatment, with the greatest improvement observed during postoperative rehabilitation.

Analysis of the association between psychoemotional

status and tumor localization demonstrated that the most pronounced disorders are observed in patients with lesions of the nasal cavity and maxillary sinus ($IPEI = 2.61 \pm 0.12$ c.u.). Less pronounced disorders were found in patients with lesions of the alveolar process of the upper jaw (1.93 ± 0.09 c.u.), and the least pronounced disorders were observed in patients with lesions of the hard and soft palate (1.42 ± 0.07 c.u.). The difference between the groups is statistically significant ($p < 0.01$) (Table 3).

Table 3. Psychoemotional indicators depending on the localization of the oncological process

Localization of the lesion	IPEI (c.u.)
Nasal cavity and maxillary sinus	2.61 ± 0.12
Upper jaw and alveolar process	1.93 ± 0.09
Hard and soft palate	1.42 ± 0.07

Note: Differences between groups were evaluated using the Kruskal-Wallis test.

According to Table 3, psychoemotional burden varied significantly according to tumor localization. The highest IPEI values were recorded in patients with lesions of the nasal cavity and maxillary sinus (2.61 ± 0.12), followed by tumors of the upper jaw and alveolar process (1.93 ± 0.09), whereas the lowest values were observed in patients with lesions of the hard and soft palate (1.42 ± 0.07). The difference between the groups was highly significant ($p < 0.01$). These findings suggest that greater psychoemotional burden is associated with increasing anatomical and functional complexity of the affected structures and greater aesthetic impairment.

Additional analysis revealed that the most pronounced disorders were characteristic of patients with damage to structures associated with speech, facial expressions, and facial aesthetics. The presence of facial asymmetry, speech and chewing defects was significantly correlated with the level of anxiety ($r = 0.61$; $p < 0.01$).

To further characterize the clinical distribution of psychoemotional burden, patients were classified into mild, moderate, and severe categories according to the dominant clinical manifestation identified during the overall clinical assessment. The distribution of these categories according to anatomical localization is presented in Table 4.

As shown in Table 4, severe psychoemotional impairment was predominantly observed in patients with lesions of the nasal cavity and maxillary sinus, whereas

moderate impairment was more common in patients with tumors of the upper jaw and alveolar process. Patients with lesions of the hard and soft palate were predominantly assigned to the mild psychoemotional burden category. This distribution indicates a close association between anatomical localization, functional impairment, and psychoemotional burden.

Table 4. Distribution of patients according to the dominant psychoemotional severity category and anatomical localization of the lesion ($n = 85$)

Severity group	Localization	<i>n</i>
Severe	Nasal cavity, sinus	27
Moderate	Upper jaw, alveolar process	34
Mild	Hard and soft palate	24

Analysis of psychoemotional status according to the clinical manifestations of deformity demonstrated that the highest IPEI values were observed in patients with facial asymmetry (2.58 ± 0.11 c.u.) and pronounced deformations of the facial skeleton (2.49 ± 0.10 c.u.), while in cases of predominantly functional disorders without pronounced deformities, this indicator was lower (1.87 ± 0.09 c.u.) (Table 5).

Table 5. Indicators of psychoemotional state depending on clinical manifestations of deformation

Clinical manifestation	IPEI (c.u.)
Facial asymmetry	2.58 ± 0.11
Deformation of the facial skeleton	2.49 ± 0.10
Predominantly functional disorders	1.87 ± 0.09

Note: Differences between groups were evaluated using the Kruskal-Wallis test.

A comparative analysis of IPEI scores between groups of patients with different clinical manifestations of deformity (facial asymmetry, facial skeletal deformity, predominantly functional disorders) revealed significant differences ($p < 0.05$).

The highest IPEI values were observed in patients with: significant facial asymmetry, impaired nasal breathing, changes in voice formation, difficulty swallowing and articulation.

Analysis according to age and sex demonstrated that

severe stress reactions were observed in 42% of patients younger than 36 years compared with 31.6% of patients aged 50 years and older. Women accounted for 80% of all recorded psychoemotional reactions, whereas men accounted for 20%, with the difference being most pronounced during the postoperative rehabilitation period.

4. Discussion

The present study demonstrates that psychoemotional distress in patients with maxillofacial malignancies follows a dynamic course throughout treatment, with the greatest psychological burden observed during hospitalization and gradual improvement during rehabilitation. This pattern is consistent with contemporary psycho-oncological models describing adaptive psychological responses following diagnosis and treatment.

During hospitalization, the highest levels of psychoemotional distress were observed. High anxiety was identified in 72.9% of patients, depressive symptoms in 64.7%, and severe psychoemotional disorders in 41.2%. The mean HADS scores for anxiety (12.4 ± 2.6) and depression (10.8 ± 2.3) exceeded the clinically significant threshold of 8 points, indicating pronounced psychoemotional distress. These findings suggest that greater psychoemotional burden is associated with the degree of anatomical disfigurement and the functional and aesthetic significance of the affected structure. Current evidence indicates that psychological distress represents one of the most common unmet supportive care needs in this patient population.^{8-10,21-25}

In the preoperative stage, anxiety and depression scores significantly decreased to 9.2 ± 2.1 and 8.3 ± 2.09 points, respectively ($p < 0.05$), which may reflect partial psychological adaptation to hospitalization and the anticipated treatment process, although perioperative psychological distress remains highly prevalent among surgical oncology patients.^{21,22} During the postoperative rehabilitation period, anxiety (6.7 ± 1.9) and depression (5.4 ± 1.6) decreased to subclinical levels. Similar trends have been reported in studies evaluating psychological adaptation, self-management interventions, and psycho-oncological support programs among cancer survivors.^{23,24} Thus, the observed temporal pattern of progressive reduction in psychoemotional distress supports current concepts of adaptive psychoemotional responses in oncology patients.

Analysis of the relationship between psychoemotional status and tumor localization demonstrated that the highest values of the integral psychoemotional evaluation index were observed in patients with tumors involving

the nasal cavity and maxillary sinus (2.61 ± 0.12 points), followed by lesions of the alveolar process of the maxilla (1.93 ± 0.09 points), whereas the lowest values were recorded in patients with tumors of the hard and soft palate (1.42 ± 0.07 points). These findings suggest that psychoemotional burden increases with the degree of anatomical disfigurement and the functional and aesthetic significance of the affected structures.²⁵⁻²⁷

Our findings are consistent with recent evidence demonstrating that facial deformity, impaired speech, mastication, swallowing, and social communication are among the strongest determinants of reduced oral health-related quality of life in head and neck cancer survivors. Recent multinational studies and systematic reviews have shown that deterioration of oral function and facial appearance significantly contributes to psychosocial burden and long-term rehabilitation challenges.^{4-6,28}

Thus, our findings demonstrate a clinically meaningful hierarchy of psychoemotional burden according to tumor localization: nasal cavity/maxillary sinus → alveolar process → hard and soft palate. This sequence reflects the actual degree of psychoemotional maladjustment associated with anatomical and functional impairment and corresponds to contemporary rehabilitation concepts in head and neck oncology.

Analysis according to the severity of clinical manifestations showed a significant increase in psychoemotional distress with worsening clinical condition. The integral psychoemotional evaluation index increased from 1.42 ± 0.07 points in patients with mild manifestations to 1.93 ± 0.09 points in patients with moderate manifestations and 2.61 ± 0.12 points in patients with severe clinical manifestations ($p < 0.01$). These findings indicate that psychoemotional disturbances are associated not only with the diagnosis itself but also with the extent of anatomical defects and functional impairment.²⁹⁻³¹

Particular attention should be paid to the relationship between psychoemotional status and facial deformity. The highest psychoemotional distress scores were observed in patients with pronounced facial asymmetry and severe facial skeletal deformities, whereas lower values were found in patients with predominantly functional disorders without major aesthetic impairment.³²⁻³⁵ These observations support the concept that altered appearance and social stigmatization represent major contributors to psychological distress. Recent studies have similarly highlighted the adverse impact of poor oral health, facial disfigurement, and impaired social functioning on both quality of life and overall outcomes in patients with head and neck cancer.^{34,35}

From a methodological perspective, the use of the HADS was justified because it remains one of the most frequently validated screening instruments in psycho-oncology. Contemporary systematic reviews have confirmed its reliability and clinical applicability for identifying anxiety and depressive symptoms among patients with head and neck cancer. According to validated HADS criteria, scores ≥ 8 indicate clinically significant anxiety or depression, while scores ≥ 11 correspond to severe psychoemotional distress, supporting the interpretation of the present findings.^{8,19,20}

Analysis of demographic characteristics revealed that psychoemotional disturbances were more pronounced among younger patients than among older individuals. This may be explained by the greater importance of social activity, professional engagement, and physical appearance in younger age groups. Similar associations between younger age and increased psychological vulnerability have been reported in recent psycho-oncological studies.^{9,10,25,36}

Psychoemotional adaptation should be considered within the broader context of disease burden, oral health status, functional impairment, and biological characteristics of head and neck malignancies, all of which may influence both survival and rehabilitation outcomes.^{7,36-38}

Women demonstrated higher anxiety and depression scores than men, which is consistent with current evidence regarding gender-related vulnerability to psychoemotional distress among oncology patients. At the same time, somatized manifestations of psychological distress appeared more frequently among male patients, reflecting previously reported gender differences in coping strategies and emotional expression.^{9,39-41}

The growing concept of cancer survivorship further emphasizes that rehabilitation outcomes should be assessed not only through clinical indicators but also through successful social reintegration, return to work, self-management abilities, and participation in everyday activities. Recent reviews have demonstrated that psychosocial adaptation remains a major challenge for head and neck cancer survivors long after completion of treatment, highlighting the importance of multidisciplinary rehabilitation programs that incorporate psycho-oncological support, prosthodontic rehabilitation, and social reintegration strategies.^{14-17,42,43}

The findings of the present study highlight the importance of integrating psychoemotional assessment into routine multidisciplinary care for patients with maxillofacial malignancies. The observed reduction in anxiety and depressive symptoms throughout the treatment and rehabilitation process suggests that successful

oncological management, combined with functional and aesthetic rehabilitation, contributes to improved psychological adaptation. At the same time, patients with tumors involving anatomically and functionally critical regions demonstrated a higher psychoemotional burden, indicating the need for targeted psychological support. These findings support the routine integration of psychoemotional assessment into multidisciplinary management protocols and emphasize the importance of individualized rehabilitation strategies combining oncological, prosthodontic, and psycho-oncological care.^{14-17,42,43}

This study was limited by a relatively modest sample size. Although a multicenter design involving three regional oncology centers was used, all participants were recruited from western Ukraine, which may limit the generalizability of the findings. The observational design precludes establishing causal relationships. The relatively short postoperative follow-up period did not allow assessment of long-term psychoemotional adaptation. Because participants were recruited from three centers and the sample size was relatively small, clustering effects could not be modeled using mixed-effects analysis. Future multicenter studies involving larger patient cohorts and longer follow-up are warranted to validate and extend these findings.

5. Conclusion

Psychoemotional disorders in patients with maxillofacial malignancies demonstrated a distinct temporal pattern, reaching maximum severity at hospital admission and progressively decreasing during the preoperative and postoperative rehabilitation stages. The greatest psychoemotional burden was observed at hospital admission (anxiety – 12.4 ± 2.6 points, depression – 10.8 ± 2.3 points, IPEI – 2.31 ± 0.09 points), with a significant decrease in the preoperative stage (IPEI – 1.87 ± 0.08 points, $p < 0.05$) and reaching the lowest values in the postoperative rehabilitation period (IPEI – 1.28 ± 0.06 points, $p < 0.01$).

The severity of psychoemotional disorders was significantly associated with tumor localization. The highest scores were recorded in cases of involvement of the nasal cavity and maxillary sinus (2.61 ± 0.12 points), the intermediate scores in cases of pathology of the upper jaw and alveolar process (1.93 ± 0.09 points), and the lowest in cases of hard and soft palate involvement (1.42 ± 0.07 points); the difference is statistically significant ($p < 0.01$).

A significant positive correlation was observed between clinical severity and psychoemotional burden: in severe cases, the IPEI score was 2.61 ± 0.12 points, in moderate

cases – 1.93 ± 0.09 points, and in mild cases – 1.42 ± 0.07 points ($p < 0.01$). The most pronounced psychoemotional disorders were found in patients with significant facial asymmetry and facial skeletal deformities.

Psychoemotional reactions were associated with age, sex, and clinical and functional characteristic. The most severe distress is observed in women and younger patients, as well as in cases of significant facial asymmetry, speech impairments, and nasal breathing difficulties, which underscores the need for tailored psychoemotional support at all stages of cancer treatment.

The findings support the routine integration of psychoemotional assessment into the multidisciplinary management of patients with maxillofacial malignancies. Early identification of anxiety and depressive symptoms, particularly in patients with extensive anatomical defects and functionally critical tumor localization, may facilitate timely psycho-oncological interventions, improve rehabilitation planning, enhance treatment adherence, and ultimately contribute to better quality of life and survivorship outcomes.

Acknowledgments

The authors thank all participants who took part in this study.

Funding

None.

Conflict of interest

The authors declare no conflicts of interest.

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Ethics approval and consent to participate

The study was approved by the Bioethics Committee (Protocol No. 6, February 18, 2021). All participants provided written informed consent.

Consent for publication

Consent for publication was obtained verbally from the participants.

Availability of data

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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