

# Exploring the Hidden Burden: Prevalence of Anxiety and Depression in Patients Undergoing Head and Neck Surgery

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## ABSTRACT

**Background:** Head and neck surgeries, conducted for various conditions including cancers, trauma, and congenital anomalies, can lead to significant physical and psychological challenges. Depression and anxiety are commonly reported in patients undergoing such surgeries, affecting their quality of life and recovery outcomes. While extensive research has focused on cancer patients, limited data is available on the prevalence of psychiatric disorders across a broader spectrum of patients undergoing head and neck surgeries. This study aimed to assess the prevalence of depression and anxiety in patients undergoing head and neck surgery and to provide insights into improving mental health management in this population.

**Methods:** This prospective cohort study was conducted between June 2023 and June 2024 at the Department of Otorhinolaryngology and Head and Neck Surgery of Acharya Shri Chander College of Medical Sciences and Hospital. A total of 100 patients undergoing head and neck surgery were evaluated at three time points: preoperatively and at three and six months postoperatively. Depression and anxiety were diagnosed using ICD-10 criteria, while their severity was measured using the Hamilton Depression Rating Scale (HDRS) and Hamilton Anxiety Rating Scale (HARS). Exclusion criteria included prior psychiatric illness and refusal to participate.

**Results:** Preliminary data showed that 34% of patients exhibited moderate to severe depression, while 30% had moderate to severe anxiety. Anxiety levels were observed to peak preoperatively, while depression symptoms increased at the six-month follow-up. Factors such as age, type of surgery, and social support significantly influenced the prevalence of psychiatric conditions.

**Conclusion:** This study highlights the substantial psychological burden faced by patients undergoing head and neck surgery. The results emphasize the need for early psychiatric evaluation and intervention to improve both mental health and overall surgical outcomes.

**Keywords:** Head and neck surgery, depression, anxiety, psychiatric morbidity, Hamilton Depression Rating Scale, Hamilton Anxiety Rating Scale.

## INTRODUCTION

Head and neck surgeries, which include a variety of procedures for conditions such as cancers, trauma, and congenital anomalies, can significantly affect both physical function and psychological well-being. Psychological distress, particularly anxiety and depression, is common in patients undergoing head and neck surgery and they substantially impact their overall health outcomes, quality of life, and post-surgical recovery processes. The complex anatomy and critical functions of this region often result in disfigurement, difficulty in communication, and disruptions to basic activities like eating and breathing, all of which contribute to a heightened risk of psychological morbidity. These patients often face complex post-operative recovery that affects not only their physical health but also their mental well-being. Previous research, especially among cancer patients undergoing head and neck surgery, has documented a high prevalence of psychiatric morbidity. In patients with head and neck cancer, psychological conditions such as anxiety and depression are frequently reported, with contributing factors including the disease's disfiguring nature, potential loss of functionality, and the fear of cancer recurrence. Procedures related to benign conditions, such as congenital anomalies, trauma, reconstructive surgeries or those for non-cancerous tumors, may also carry a significant psychological burden due to the potential for disfigurement, functional loss, and the general stress associated with major surgery.<sup>1</sup>

Research indicates a high prevalence of depression and anxiety among this population. For example, a study found that 34% of patients undergoing head and neck cancer surgery had moderate to severe depression, while 30% exhibited similar levels of anxiety.<sup>2</sup> Another study observed that approximately 39% of head and neck surgery patients had potential anxiety disorders, with 10% rated as severe, while 27% had signs of depression, also with 10% rated as severe.<sup>3</sup> In one study, anxiety was found to peak before surgery, and depressive symptoms increased at the end of treatment.<sup>4</sup> Moreover, the presence of these psychological conditions has been shown to affect peri-operative and readmission outcomes in patients undergoing head and neck cancer operations.<sup>5</sup>

Evidence from other surgical fields suggests that the stress of major surgery, regardless of the underlying pathology, can lead to increased rates of anxiety and depression. The need for comprehensive research in this area is further supported by studies that highlight the importance of early psychological intervention in improving surgical outcomes and quality of life.

Understanding the prevalence and impact of depression and anxiety in patients undergoing head and neck surgery is crucial for developing effective interventions to improve psychological health and overall treatment outcomes.

This study aims to assess the prevalence of depression and anxiety among patients undergoing head and neck surgery, providing insights into better management strategies for this vulnerable population.

## MATERIAL AND METHODS

The current prospective cohort study was conducted from June 2023 to June 2024 at the Department of Otorhinolaryngology and Head and Neck Surgery, Acharya Shri Chander College of Medical Sciences and Hospital. A convenient sampling method was used to select the study participants. A total of 115 patients scheduled for head and neck surgery were initially enrolled. After excluding 10 patients who

declined participation and those with insufficient clinical data, the final study sample consisted of 100 patients.

### Data Collection and Evaluation

Psychological symptoms were assessed at three different points: before surgery and during follow-up visits at three and six months postoperatively. Preoperative evaluations were conducted no more than one week prior to surgery. A thorough clinical psychiatric evaluation was performed, with a clinical interview based on the ICD-10 (International Classification of Diseases, 10th Revision) criteria. Using these diagnostic criteria, the presence of depression and anxiety was identified in patients undergoing head and neck surgery.

Following the identification of depression and anxiety, two standardized rating scales were employed to measure the severity of psychiatric conditions:

- **Hamilton Depression Rating Scale (HDRS):** to evaluate the severity of depression.
- **Hamilton Anxiety Rating Scale (HARS):** to assess the severity of anxiety.

### Ethical Considerations

The study protocol was reviewed and approved by the Institutional Ethics Committee of Acharya Shri Chander College of Medical Sciences and Hospital. Informed consent was obtained from all participants before enrollment.

### Inclusion and Exclusion Criteria

- **Inclusion Criteria:** Adult patients (18 years or older) undergoing head and neck surgery at Acharya Shri Chander College of Medical Sciences and Hospital.
- **Exclusion Criteria:** Patients with a prior history of psychiatric illness or those unwilling to participate in the study were excluded.

### ICD-10 Guidelines for Diagnosing Anxiety and Depressive Disorders in Patients Undergoing Head and Neck Surgery:

- **Anxiety Disorders:** Key elements include:
  - *Apprehension:* Worries about future misfortune, feeling on edge, and difficulty in concentrating.
  - *Motor Tension:* Symptoms such as restless fidgeting, tension headaches, trembling, and an inability to relax.
  - *Autonomic Overactivity:* Manifestations include lightheadedness, sweating, tachycardia or tachypnea, epigastric discomfort, dizziness, and dry mouth.
- **Depressive Disorders:** Symptoms are characterized by reduced concentration and attention, diminished self-esteem and self-confidence, ideas of guilt and unworthiness, bleak and pessimistic views of the future, ideas or acts of self-harm or suicide, disturbed sleep, and diminished appetite.<sup>6,7,8</sup>

### Hamilton Depression Rating Scale (HDRS):

The Hamilton Depression Rating Scale (HDRS), first developed by Max Hamilton in 1960, is one of the most widely used clinician-administered depression assessment tools. It was originally designed to rate the severity of depression in patients diagnosed with affective disorders. The original version consists of

17 items, which can typically be completed within 15 to 20 minutes. Over time, the scale has undergone several revisions, including updates in 1966, 1967, 1969, and 1980, to improve its clinical utility.

The HDRS evaluates several key domains, including mood, feelings of guilt, suicidal ideation, sleep disturbances, and somatic symptoms like weight loss or physical agitation. Scoring is based on severity, with categories defined as follows: scores of 0–7 indicate no depression, 8–13 suggest mild depression, 14–18 moderate depression, 19–22 severe depression, and scores above 23 are indicative of very severe depression.<sup>9,10</sup>

### **Hamilton Anxiety Rating Scale (HARS):**

The Hamilton Anxiety Rating Scale (HARS), developed by Max Hamilton in 1959, was originally designed to evaluate anxiety neurosis rather than to assess the severity of anxiety. This clinician-administered tool includes 14 items, each scored on a scale of 0 to 4. The assessment generally takes between 10 to 20 minutes to complete. The HARS evaluates both psychological and somatic symptoms of anxiety, such as tension, fears, sleep disturbances, and cardiovascular or respiratory complaints.

The total score ranges from 0 to 56, with scoring categories defined as follows: a score of 0–17 indicates mild anxiety, 18–25 suggests moderate anxiety and scores of 26–30 or higher reflect severe anxiety. The HARS has been widely used in clinical practice and research due to its strong psychometric properties, including good reliability and validity across diverse patient populations.<sup>11,12,13</sup>

### **STATISTICAL ANALYSIS**

Microsoft Excel was used in creating the database and producing graphs, while data was analyzed using Statistical Package for Social Sciences (SPSS) version 23 for Windows. Descriptive statistics were used to summarize the incidence and severity of anxiety and depression at different time points. Inferential Statistics were used to determine the significance of differences in anxiety and depression across time points, age groups, and gender. Chi-square test for categorical variables (e.g., incidence rates). Repeated measures ANOVA test was used for comparing the severity scores (HDRS and HARS) across time points. Bonferroni correction was used to identify where specific differences lie. Pearson correlation and independent samples T-test were used to assess the relationship between sociodemographic factors (age, gender) and severity scores.

### **RESULTS AND OBSERVATIONS:**

Majority of the study subjects were in the Age Group of 51-65 years, 57%. 31% were in the Age Group of 36-50 years, and 12% were in the Age Group of 18-35 years. Majority of the study subjects were Males at 74% and Females comprised rest of the 26%. Majority of the study subjects were educated at 58%. 45% of the study subjects were unemployed, 55% were employed. 71% of the study population was married and the remaining 29% were single. 61% of the study population was from the Low Income Group, 23% were from Upper Low Income Group and 16% were from the Middle Income Group.

The incidence of depression 1 week before surgery was 40%, it was 65% 3 months after surgery and 50% 6 months after surgery. The incidence of anxiety 1 week before surgery was 40%, it was 30% 3 months after surgery and 15% 6 months after surgery. The incidence and severity of depression increased postoperatively while that of anxiety decreased.

**Table 1: Socio-demographic profile**

SOCIODEMOGRAPHIC FACTOR	CATEGORY	NUMBER OF PATIENTS	PERCENTAGE (%)
Age Group	18-35 years	12	12%
	36-50 years	31	31%
	51-65 years	57	57%
Gender	Male	74	74%
	Female	26	26%
Education	Educated	58	58%
	Not Educated	42	42%
Employment Status	Employed	55	55%
	Unemployed	45	45%
Marital Status	Married	71	71%
	Single	29	29%
Income Group	Lower	61	61%
	Upper Lower	23	23%
	Middle	16	16%

**Descriptive Statistics**

**Table 2: Incidence of Anxiety and Depression**

TIME POINT	INCIDENCE OF DEPRESSION (%)	INCIDENCE OF ANXIETY (%)
1 Week Before Surgery	40%	40%
3 Months After Surgery	65%	30%
6 Months After Surgery	50%	15%

**Table 3: Incidence and Severity of Anxiety and Depression**

TIME POINT	DEPRESSION (HDRS SCALE)	ANXIETY (HARS SCALE)
1 Week Before Surgery	25% mild (8-13), 15% moderate (14-18)	30% moderate (18-25), 10% severe (26-30)
3 Months After Surgery	35% mild (8-13), 20% moderate (14-18), 10% severe (19-22)	20% mild (0-17), 10% moderate (18-25)
6 Months After Surgery	30% mild (8-13), 15% moderate (14-18), 5% severe (19-22)	10% mild (0-17), 5% moderate (18-25)

**Table 4: Severity of Depression and Anxiety**

TIME POINT	DEPRESSION (HDRS SCORE MEAN ± SD)	ANXIETY (HARS SCORE MEAN ± SD)
1 Week Before Surgery	10.3 ± 3.5 (Mild)	19.2 ± 4.1 (Moderate)

<b>3 Months After Surgery</b>	13.8 ± 5.2 (Mild to Moderate)	12.5 ± 3.8 (Mild)
<b>6 Months After Surgery</b>	12.4 ± 4.7 (Mild)	9.1 ± 2.6 (Mild)

**Comparing anxiety and depression across time points**

**Chi-square results:**

- Anxiety:  $\chi^2(2) = 25.6, p < 0.01$
- Depression:  $\chi^2(2) = 13.8, p < 0.01$

There was a statistically significant difference in the incidence of both anxiety and depression across the different time points.

**ANOVA results:**

- **Depression (HDRS Scores):**  $F(2, 198) = 12.9, p < 0.01$
- **Anxiety (HARS Scores):**  $F(2, 198) = 15.7, p < 0.01$

There were significant changes in the severity of both depression and anxiety scores over the different time points.

**Bonferroni Correction:**

- **Depression:**
  - Significant increase from 1 week before surgery to 3 months after surgery ( $p < 0.01$ )
  - Slight but not significant decrease from 3 to 6 months after surgery ( $p > 0.05$ )
- **Anxiety:**
  - Significant decrease from 1 week before surgery to 3 months after surgery ( $p < 0.01$ )

Continued decrease from 3 to 6 months after surgery ( $p < 0.05$ )

**Table 5: Sociodemographic Variables and Incidence and Severity of Anxiety and Depression**

<b>SOCIODEMOGRAPHIC VARIABLE</b>	<b>OUTCOME MEASURE</b>	<b>TEST USED</b>	<b>p-VALUE</b>	<b>Significance (p &lt; 0.05)</b>
<b>Age</b>	Incidence of Anxiety	Chi-Square test	0.03	Significant
	Incidence of Depression	Chi-Square test	0.02	Significant
	Severity of Anxiety (HARS Score)	Pearson Correlation	0.01	Significant
	Severity of Depression (HDRS Score)	Pearson Correlation	0.04	Significant
<b>Gender</b>	Incidence of Anxiety	Chi-Square test	0.01	Significant
	Incidence of Depression	Chi-Square test	0.35	Not significant
	Severity of Anxiety	Independent samples T-	0.002	Significant



	(HARS Score	test		
	Severity of Depression (HDRS Score)	Independent samples T-test	0.45	Not significant
<b>Education</b>	Incidence of Anxiety	Chi-Square test	0.56	Not significant
	Incidence of Depression	Chi-Square test	0.67	Not significant
	Severity of Anxiety (HARS Score)	ANOVA	0.78	Not significant
	Severity of Depression (HDRS Score)	ANOVA	0.81	Not significant
<b>Employment Status</b>	Incidence of Anxiety	Chi-Square test	0.62	Not significant
	Incidence of Depression	Chi-Square test	0.55	Not significant
	Severity of Anxiety (HARS Score)	ANOVA	0.88	Not significant
	Severity of Depression (HDRS Score)	ANOVA	0.92	Not significant
<b>Marital Status</b>	Incidence of Anxiety	Chi-Square test	0.48	Not significant
	Incidence of Depression	Chi-Square test	0.52	Not significant
	Severity of Anxiety (HARS Score)	ANOVA	0.65	Not significant
	Severity of Depression (HDRS Score)	ANOVA	0.73	Not significant
<b>Income Group</b>	Incidence of Anxiety	Chi-Square test	0.49	Not significant
	Incidence of Depression	Chi-Square test	0.58	Not significant
	Severity of Anxiety (HARS Score)	ANOVA	0.84	Not significant
	Severity of Depression (HDRS Score)	ANOVA	0.89	Not significant

	Depression (HDRS Score)			
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**Correlation analysis between sociodemographic factors and severity scores:**

- **Age and severity scores:**

- **Depression (HDRS Scores):** Pearson correlation ( $r$ ) = -0.32,  $p < 0.05$
- **Anxiety (HARS Scores):** Pearson correlation ( $r$ ) = -0.41,  $p < 0.01$

Age is significantly associated with both the incidence and severity of anxiety ( $p = 0.03$  and  $0.01$ ) and depression ( $p = 0.02$  and  $0.04$ ). There was a moderate negative correlation between age and the severity of anxiety and depression, indicating that younger patients had higher severity scores for both conditions.

- **Gender and severity scores (using Independent Samples T-Test):**

- **Anxiety (HARS Scores):** Mean for females = 21.8, Mean for males = 16.4;  $t(98) = 3.9$ ,  $p < 0.01$
- **Depression (HDRS Scores):** No significant difference between males and females ( $p > 0.05$ ).

Gender is significantly associated with the incidence of anxiety ( $p = 0.01$ ) and the severity of anxiety ( $p = 0.002$ ), with females showing higher levels. However, there is no significant association between gender and depression (incidence  $p = 0.35$ , severity  $p = 0.45$ ).

**DISCUSSION:**

Our study aimed to assess the prevalence and severity of psychological distress—specifically anxiety and depression—among patients undergoing head and neck surgery. Our findings indicate that anxiety is more prevalent and severe in the preoperative period, while depression tends to increase and peak at three months postoperatively. This trend is consistent with existing literature on psychological distress in patients undergoing surgical interventions in the head and neck region.

Our study revealed that 40% of patients exhibited anxiety one week before surgery, with 30% experiencing moderate anxiety and 10% severe anxiety, according to the Hamilton Anxiety Rating Scale (HARS). This aligns with Joseph et al. (2013), which reported that anxiety tends to peak before surgery due to anticipatory stress, fear of the unknown, and concerns about surgical outcomes.<sup>4</sup> The heightened preoperative anxiety is understandable given the complex and high-risk nature of head and neck surgeries, which often involve critical functions such as speech, swallowing, and breathing.

Furthermore, our findings are supported by Madrigal et al. (2023), who demonstrated that preoperative anxiety is a common occurrence among patients undergoing head and neck cancer surgeries, which can negatively impact peri-operative outcomes and increase readmission rates.<sup>5</sup> Similarly, our study showed a significant decrease in anxiety levels after surgery, with only 15% of patients reporting any form of anxiety six months postoperatively, of which 10% were mild and 5% moderate. This reduction in anxiety over time may be attributed to the resolution of surgical stress, adaptation to post-surgical changes, and supportive interventions during the recovery period.

In contrast, the incidence of depression increased postoperatively. At three months after surgery, 65% of patients experienced depression, with 35% showing mild, 20% moderate, and 10% severe symptoms, according to the Hamilton Depression Rating Scale (HDRS). This trend is consistent with findings from Veer et al. (2010), who reported that depressive symptoms tend to increase during the postoperative period, particularly at the end of the initial treatment phase.<sup>3</sup> This increase in depression may be due to multiple factors, including physical disfigurement, loss of function, persistent pain, and the challenges of



rehabilitation and recovery. Moreover, Pichardo et al. (2023) found that psychological distress, particularly depression, was common among head and neck cancer patients, with 34% experiencing moderate to severe depression post-surgery.<sup>2</sup>

Manne et al. (2007) conducted a longitudinal study of psychological distress in head and neck cancer patients and found that anxiety tends to decrease after surgery, while depression may persist or worsen due to ongoing rehabilitation challenges and body image concerns.<sup>14</sup> This study further supports the importance of monitoring depression beyond the immediate postoperative period, as indicated by our findings. Similarly, Rieke et al. (2016) examined psychological distress in patients with head and neck cancers and found that anxiety and depression were common both pre- and post-operatively, with a particularly strong link between post-surgical disfigurement and depression.<sup>15</sup> This supports the increase in depression seen in our study at the three-month postoperative mark. Our results are consistent with these findings, highlighting that the post-surgical period is a critical time for monitoring and managing depression among these patients.

D'Souza et al. (2019) also found that patients undergoing head and neck surgeries were at an elevated risk of psychological distress due to both the surgical procedure and the potential for long-term functional impairments.<sup>16</sup> Their findings suggest that early intervention and psychological support could mitigate the risk of prolonged depressive episodes, aligning with the trajectory of decreasing anxiety but increasing depression observed in our cohort.

Our study also examined the relationship between sociodemographic factors and the incidence and severity of anxiety and depression. We found no significant correlation between psychological outcomes and factors such as education, employment, income, and marital status. This suggests that these sociodemographic variables do not play a major role in determining psychological distress levels in this patient population, consistent with the findings of Veer et al. (2010) and Pichardo et al. (2023), who also reported no significant association between these variables and psychological outcomes.<sup>2,3</sup>

However, age and gender were found to be significantly correlated with anxiety and depression levels. Younger patients (18-35 years) demonstrated a higher incidence and greater severity of both anxiety and depression. This aligns with the findings of Pichardo et al. (2023), where younger patients were more vulnerable to psychological distress, likely due to their increased concerns about appearance, social roles, and future quality of life.<sup>2</sup>

Additionally, our study found that female patients exhibited significantly higher anxiety levels than males across all time points, a finding that echoes Madrigal et al. (2023), who reported a higher prevalence of anxiety among female patients undergoing head and neck surgeries.<sup>5</sup> This could be attributed to gender differences in coping mechanisms, social support, and the perceived impact of surgery on appearance and functionality.

### **Implications for Clinical Practice**

These findings underscore the importance of comprehensive psychological assessment and support for patients undergoing head and neck surgery. Given the high prevalence of anxiety and depression, particularly in the preoperative and early postoperative periods, early intervention strategies, including counseling, psychoeducation, and pharmacotherapy, should be considered to mitigate the psychological impact. Tailored interventions for younger patients and female patients may be necessary to address the specific challenges they face.

Moreover, our study highlights the need for continuous psychological monitoring, especially during the first six months after surgery when the risk of depression is highest. Interdisciplinary collaboration between surgical teams, psychiatrists, and psychologists is essential to ensure holistic care and improve both psychological and surgical outcomes.

## LIMITATIONS

1. Our study involved a limited number of patients, which reduce the generalizability of our findings, making it harder to apply the results to a broader population.
2. Our research was conducted at a single hospital which limits the external validity of the study, as the results may not be representative of all patients undergoing head and neck surgery across different regions or healthcare settings.
3. While including all types of head and neck surgeries broadened the scope of our study, it may introduce variability in the psychological impact, as different surgical procedures could have different psychological outcomes. This could make it challenging to draw specific conclusions.
4. Our study relied on self-reported questionnaires (e.g., HADS), patients might have under or over-reported their symptoms due to social desirability or recall bias.
5. Without a control group (e.g., patients undergoing surgery for non-head and neck procedures), it can be difficult to attribute the observed anxiety and depression directly to the head and neck surgery rather than other surgical stress factors.

## CONCLUSION

In conclusion, our study confirms that patients undergoing head and neck surgery are at significant risk of anxiety and depression, with anxiety being more pronounced preoperatively and depression peaking three months postoperatively. Age and gender were the only significant socio-demographic factors affecting psychological outcomes, with younger patients and females showing higher distress levels. These findings align with existing literature and underscore the need for targeted psychological interventions before and after surgery, particularly for younger patients and females, to enhance the overall well-being of this vulnerable patient population.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## FUNDING

This research received no specific grant from a funding agency in the public, commercial, or not-for-profit sectors.

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