

# Preoperative Anxiety in Oral-maxillofacial Surgery and Related Risk Factors: A Retrospective Study

## *Oral-maksillofasiyal Cerrahilerde Preoperatif Anksiyete ve İlişkili Risk Faktörleri: Bir Retrospektif Çalışma*

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### Keywords

Dental anxiety, oral and maxillofacial surgery, Beck anxiety inventory

### Anahtar Kelimeler

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### Abstract

**Objective:** Anxiety is a temporary emotional state of tension, nervousness, fear and high autonomic nervous system activity. We aimed to investigate the anxiety status of patients before maxillofacial surgery and to analyse the relationship between anxiety and demographical/clinical data.

**Materials and Methods:** In this retrospective study, we reviewed the files of 333 patients aged 16-60 years, who were scheduled for oral-maxillofacial surgery. The patients were interviewed before the surgery to determine their levels of preoperative anxiety using the Beck anxiety inventory. Demographic information was collected using a structured questionnaire [age, sex, American Society of Anesthesiologists (ASA) score, civil status, educational status, having major/minor surgery, informed about the surgery, history of previous surgery, job status, economic status, health insurance and having a child in need of care]. The levels of anxiety were allocated into 3 groups: 0 to 15, low to mild anxiety; 16 to 25, moderate anxiety and 26 to 63, severe anxiety. Multivariate conditional regression modelling was used to determine independent predictors of preoperative anxiety and to analyse the relationship between anxiety and risk factors.

**Results:** High preoperative anxiety was associated with female gender [odds ratio (OR): 2.29], ASA-II (OR: 1.38), more than 12 years of education (OR: 1.68), major surgery (OR: 1.52), being a housewife (OR: 1.76), being single (OR: 1.93), absence of health insurance (OR: 2.01) and having a child in need of care (OR: 2.18). Previous surgery (OR: 0.61) and being informed about the surgery (OR: 0.58) were associated with a lower risk for preoperative anxiety.

**Conclusion:** It is highly important in surgical practice to carefully observe patients and provide an appropriate preoperative anxiety management in order to avoid the bothersome intra- and postoperative results of preoperative anxiety.

### Öz

**Amaç:** Anksiyete, geçici bir duygusal gerilim, sinirlilik, korku ve yüksek otonom sinir sistemi aktivitesi halidir. Amacımız maksillofasiyal cerrahi öncesi hastanın anksiyete durumunu araştırmak ve anksiyete ile demografik/klinik veriler arasındaki ilişkiyi incelemektir.

**Gereç ve Yöntemler:** Bu retrospektif çalışma oral maksillofasiyal cerrahi yapılan 16-60 yaşları arasındaki 333 hastanın dosyası taranarak gerçekleştirilmiştir.

Hastalara, ameliyat öncesi kaygı düzeylerini belirlemek amacıyla Beck anksiyete indeksi uygulandı. Demografik veriler ise [yaş, cinsiyet, Amerikan Anesteziyoloji Derneği (ASA) skoru, medeni durum, eğitim durumu, geçirilecek operasyonun büyük/küçük olması, kendisine operasyon hakkında bilgilendirme yapılmış veya yapılmamış olması, daha önce ameliyat öyküsü olup olmaması, iş durumu, ekonomik durum, sağlık sigortası ve bakıma muhtaç çocuk sahibi olup olmaması] yapılandırılmış bir anket kullanılarak kayıt altına alındı. Anksiyete seviyeleri 3 gruba ayrıldı: Düşük anksiyete (8-15 skorları), orta derecede anksiyete (16-25 skorları), şiddetli anksiyete (26-63). Preoperatif anksiyetenin bağımsız etkenlerini belirlemek ve anksiyete ile risk faktörleri arasındaki ilişkiyi analiz etmek için çok değişkenli koşullu regresyon analizi kullanıldı.

**Bulgular:** Kadın hastalarda [risk oranı (OR): 2,29], ASA-II grubunda (OR: 1,38), 12 yıldan fazla eğitim görmüş olan hastalarda (OR: 1,68), büyük cerrahi operasyon geçirecek olanlarda (OR: 1,52), iş grupları arasında ev hanımlarında (OR: 1,76), medeni durumu bekar olanlarda (OR: 1,93), sağlık sigortasının olmayanlarda (OR: 2,01) ve bakıma muhtaç en az bir çocuğa sahip olanlarda (OR: 2,18) daha yüksek anksiyete var olduğu saptanmıştır. Anamnezinde cerrahi öyküsü olanlarda (OR: 0,61) ve operasyon hakkında bilgilendirilme yapılan hastalarda (OR: 0,58) preoperatif anksiyetenin daha düşük olduğu saptanmıştır.

**Sonuç:** Cerrahi uygulamada, ameliyat öncesi anksiyetenin rahatsız edici intra ve postoperatif sonuçlarından kaçınmak için hastaları dikkatle gözlemek ve uygun preoperatif anksiyete yönetimini uygulamak son derece önemlidir.

## Introduction

Emotional problems such as fear, anxiety, uncertainty, loss of control, and decreased self-esteem are possible in patients facing hospital entry and surgery. Preoperative anxiety symptoms are stress and discomfort, and the sympathetic, parasympathetic and endocrine system are well-known factors in this situation (1). Despite the progress in surgery and anesthesia, anxiety is an important problem for the majority of patients scheduled for surgery (2). Anxiety directly affects health care costs by increasing postoperative pain and analgesic consumption and prolonging hospital stay (3). Various medications and patient trainings are recommended to control these disturbed states.

A self-assessment scale was developed by Beck et al. (4) in 1988 to determine the frequency of anxiety symptoms experienced by individuals. It is a likert type scale consisting of 21 questions scored between 0-3.

Anxiety is a common condition in patients requiring surgical treatment. While anxiety causes the development of unstable vital-hemodynamic symptoms in the patient, it increases postoperative pain and nausea-vomiting, thereby affecting prolonged recovery and hospital stay (5). For this reason, it may be important to identify sensitive individuals on this subject. The purpose of this study is to determine the level of preoperative anxiety specific to oral-maxillofacial surgery and the related risk factors.

## Materials and Methods

This retrospective study's sample was derived from the population of patients who presented to the

Department of Oral and Maxillofacial Surgery at the University of Aydın Adnan Menderes, for underwent of general anesthesia between 2017-2019. Helsinki and the Local Ethics Committee of Adnan Menderes University (Aydın, Turkey) approved it with 2020/059 ethical number. Subjects eligible for study inclusion had impacted mandibular third molars which need to remove bone and/or tooth sectioning for extraction, age $\geq$ 18 and consented to the study enrollment. Subjects were excluded for study enrollment if they had a history of psychiatric disease, anxiety-induced drug use, presence of systemic disease that affects cognitive functions and abnormal preoperative hemodynamic findings.

In order to examine the factors affecting preoperative anxiety, patients undergoing maxillofacial surgery between January 2017 and December 2019, aged 16-60 years, with American Society of Anaesthesiologists (ASA) physical status classification I-II were included in the study. Patients with ASA III and IV were excluded.

Beck anxiety inventory (BAI) scores taken from the patients' files which were routinely evaluated before the operation, were recorded. It was named as low level anxiety between 8-15 points, moderate anxiety between 16-25, and high level anxiety between 26-63. BAI score of 0-7 means absence of anxiety.

Patients are grouped as age is below 25 and above 25, gender is female and male, systemic status as ASA I and ASA II, surgical type (invasive tissue cutting are major others minor), with previous surgical experience or not, educational status below 12 years and above 12 years, marital status as married and single, with or without pre-surgery information,

job status as unemployed, low-wage employee, high-wage employee or house wife, having health insurance or not, have at least one dependent child or not. These were identified as risk factors that may affect the presence of anxiety.

### Statistical Analysis

The effect of potential risk factors on patients according to the presence of anxiety was evaluated by performing multivariate conditional regression analysis. Odds ratio, 95% confidence interval and Wald statistical values of each independent variable were measured ( $p < 0.05$ : significant).

### Results

Thirty seven patients were excluded from the study because of the psychiatric disease history, anxiety-related drug use, the presence of systemic diseases affecting cognitive functions and abnormal preoperative hemodynamic findings. The study was performed on 333 patients.

Based on BAI, the number of patients without anxiety was 49 (15%) and with anxiety was 284 (85%). Mild anxiety was found in 132 patients (40%), moderate anxiety in 91 (27%), and severe anxiety in 61 (18%).

Age and economic status of potential risk factors were not effective on anxiety. Female gender, ASA II (chronic disease), having major surgery, no experience of surgery, education status is over 12 years, to be married, no preoperative information, being housewife, absence of health insurance and having a child in need of care are factors affecting preoperative anxiety ( $p < 0.05$ ) (Tables 1, 2).

### Discussion

Anxiety is a universal feature in the preoperative setting. The incidence of anxiety ranges from 8% to 80% (6-9). This variance in incidence is mainly explained by different tools and methods used to diagnose preoperative anxiety. For example, Malvania

**Table 1. The relationship between the degree of anxiety and potential risk factors**

Preoperative anxiety Beck anxiety inventory	Mild (8-15) (n)	Moderate (16-25) (n)	Severe (26- 63) (n)	OR	CI 95%	p
Age						
≤25y	74	63	37	0.99	(0.73-1.35)	≥0.05
>25y	58	28	24			
Sex						
Female	90	40	19	2.29	(1.36-3.89)*	≤0.05*
Male	22	19	7			
ASA						
I	89	35	33	1.38	(1.01-1.89)*	≤0.05*
II	46	41	40			
Surgery type						
Major	67	54	45	1.52	(1.18-2.14)*	≤0.05*
Minor	39	41	38			
Previous surgery						
+	59	88	62	0.61	(0.39-0.98)*	≤0.05*
-	21	23	31			
Educational status						
≤12y	65	74	25	1.68	(1.12-2.46)*	≤0.05*
>12y	59	43	18			
Civil status						
Single	68	38	25	1.93	(1.13-2.62)*	≤0.05*
Married	64	53	36			

Table 1. continued

Informed about operation						
+	109	45	43	0.58	(0.37-0.95)*	≤0.05*
-	46	21	20			
Job status						
Unemployed	22	31	16	1.76	(1.16-2.32)*	≤0.05*
Selfemployed	15	18	13			
Employed	18	17	10			
Housewife	20	51	53			
Economic status						
≤2000 tl	64	52	38	1.07	(0.68-1.68)	≥0.05
>2000 tl	58	38	34			
Health insurance						
+	64	42	35	2.01	(1.43-3.57)*	≤0.05*
-	42	53	48			
Child need of care						
+	102	46	42	2.18	(1.11-4.06)*	≤0.05*
-	53	20	21			
ASA: The American Society of Anesthesiologists, CI: Confidence interval, tl: Turkish liras, OR: Odds ratio						
*Multivariate conditional regression analysis, significant at p<0.05						

and Ajithkrishnan (10) used the Modified Dental Anxiety scale in their study in 2011 and calculated the ratio of dental anxiety as 46%. In our study, anxiety was diagnosed in 85% of patients according to BAI.

There are many evidence does not confirm age as a risk factor for preoperative anxiety (9,11,12). In also our study, it was confirmed that age had no effect on preoperative anxiety.

In their study in 2018, Jeddy et al. (13) found that although the majority of patients participating in their study were male, the presence of anxiety was statistically higher in women. In the studies of Cianetti et al. (14) in 2017, it was proved that female gender is more prone to dental anxiety than male gender. In our study, similar to these studies, it was found that dental anxiety was more common in women and the view that being a woman is a risk factor for preoperative anxiety was supported.

When anxiety is defined as the fear of losing the patient's well-being, it is a natural consequence that patients with higher ASA scores who are closer to the possibility of losing good health have higher anxiety.

Table 2. Effective independent risk factors according to anxiety levels

Beck anxiety inventory score	Risk factors	p
Moderate anxiety score (16-25)	>25y of age	0.07
	Single	422
	Female	<0.001*
	Low educational level	782
	Major surgery	<0.001*
	Housewife	0.003*
	Bad economic status	0.258
Severe anxiety score (26-63)	>25y of age	0.287
	Female	<0.001*
	Single	0.005*
	Low educational status	<0.001*
	Major surgery	0.553
	Housewife	0.011*
	Bad economic status	0.084
Significant at p<0.05		

In a study conducted by Facco et al. (15) in 2008, they found that patients with higher ASA scores had higher anxiety levels. As also evidenced in our study, higher ASA score should be evaluated as a predisposing factor in terms of anxiety.

Whether surgery is major or minor directly affects the patient's level of anxiety for the procedure. The complexity of the procedure directly affects the anxiety level of the patient (16). The fact that patients have not previously experienced surgery causes a low level of knowledge which makes the person potentially anxious. In the study published by Sørli et al. (17) in 2007, it was proved that the level of anxiety decreased statistically significantly in patients who were informed. In addition, Kazancıoglu et al. (18) they supported the view that visual information supported by videos contributed positively to lowering the level of anxiety in 2017. In our study, the level of anxiety is higher in patients who will undergo major surgery and who were not informed, whereas in patients who have previously undergone surgery, the level of anxiety is lower. As can be seen from these results, the unknown triggers the patient's anxiety. When the patient's level of consciousness increases with surgical experience or informative methods, anxiety decreases.

However; although increasing the level of knowledge about the procedure to be performed causes anxiety to decrease, the high education level of the patients may be a predisposing factor for dental anxiety. Since the questioning skills of patients with higher education levels will be higher, the number of questions they cannot predict will be more. The desire of these patients to control what is happening leads them to anxiety. Hernández-Palazón et al. (19) and Perks et al. (12) showed that higher education level is a predisposing factor on surgical anxiety. In our study, supporting this view, it was found that patients with higher education level experienced more intense anxiety, supporting this view.

Surgical anxiety increases with the intensive consideration of the surgical procedure, rather than considering other factors that are important in the patient's life. Parents who have children in need of care cannot concentrate on their own fears, as they care about their children before themselves. Having a job and unconscious thoughts about the job also prevent

the patient's thought intensity from concentrating on the process to be done. Furthermore, The patient's lack of health insurance causes the patient to concentrate more on the economic aspects of the procedure to be performed. Since the surgical procedure will remain secondary in patients who need to think more other factors than themselves, low anxiety level is an inevitable result in these patients. In our study, the level of anxiety was found to be significantly low in patients with a child in need of care and in patients do not have health insurance. Moreover, the level of anxiety in housewives was significantly higher than patients who worked in any job.

## Conclusion

This study contributes to the determination of factors affecting patients' anxiety level against the surgical procedure. Although anxiety correlates negatively with the patients' knowledge of the procedure, patients with higher education levels are more likely to have anxiety. In addition, if there is a more important factor in patients' life than their own situation, it causes the level of anxiety to be lower than other patients because they think less about the surgical procedure. Further studies are needed to investigate patients' fears for the surgical procedure.

## Ethics

**Ethics Committee Approval:** Helsinki and the Local Ethics Committee of Aydın Adnan Menderes University (Aydın, Turkey) approved it with 2020/059 ethical number.

**Informed Consent:** Subjects eligible for study inclusion had impacted mandibular third molars which need to remove bone and/or tooth sectioning for extraction, age  $\geq 18$  and consented to the study enrollment.

**Peer-review:** Externally peer-reviewed.

## Authorship Contributions

Concept: Ö.K., Design: B.G., Supervision: B.G., Ö.K., Materials: U.K., Z.B.D., Data Collection or Processing: U.K., B.G., Analysis or Interpretation: Ö.K., Literature Search: B.G., Writing: B.G., U.K., Critical Review: Ö.K.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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