HİTİT MEDICAL JOURNAL
HİTİT ÜNİVERSİTESİ TIP FAKÜLTESİ DERGİSİ

e-ISSN: 2687-4717 Cilt|Volume: 7 • Sayı|Issue: 1 - Şubat|February 2025

Effect of Preanesthetic Assessment Timing on Preoperative Anxiety in Ambulatory Surgery Patients

Ambulatuvar Cerrahi Hastalarında Preanestezi Değerlendirme Zamanlamasının Preoperatif Anksiyete Üzerine Etkisi

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Makale Bilgisi | Article Information
Makale Türü | Article Type: Araştırma Makalesi | Research Article
Doi: https://doi.org/10.52827/hititmedj.1448591
Geliş Tarihi | Received: 19.03.2024
Kabul Tarihi | Accepted: 16.10.2024
Yayım Tarihi | Published: 25.02.2025

Atıf | Cite As
Ateş Ayhan N, Hancı V, Özbilgin Ş, Yurtlu BS. Effect of Preanesthetic Assessment Timing on Preoperative Anxiety in Ambulatory Surgery Patients. Hitit Medical Journal 2025;7(1):61-69. https://doi.org/10.52827/hititmedj.1448591

Hakem Değerlendirmesi: Alan editörü tarafından atanan en az iki farklı kurumda çalışan bağımsız hakemler tarafından değerlendirilmiştir.
Etik Beyanı: Çalışma için 21/04/2016 tarihinde Dokuz Eylül Üniversitesi Girişimsel Olmayan Araştırmalar Etik Kurulu'ndan onay alınmıştır. Karar no: 2016/11-14.
İntihal Kontrolleri: Evet (iThenticate)
Çıkar Çatışması: Yazarlar çalışma ile ilgili çıkar çatışması beyan etmemiştir.
Şikayetler: hmj@hitit.edu.tr
Katkı Beyanı: Fikir/Hipotez NAA, BSY Tasarım BSY, ŞÖ Veri Toplama/Veri İşleme: NA, ŞÖ, VH Veri Analizi VH, BSY Makalenin Hazırlanması: NAA, VH, BSY.
Hasta Onamı: Tüm hastalardan yazılı bilgilendirilmiş onam alınmıştır.
Finansal Destek: Bu çalışma ile ilgili herhangi bir finansal kaynaktan yararlanılmamıştır.

Peer Review: Evaluated by independent reviewers working in the at least two different institutions appointed by the field editor.
Ethical Statement: Approval for the study was obtained from the Dokuz Eylül University Non-Interventional Research Ethics Committee on 21/04/2016. Decision no: 2016/11-14.
Plagiarism Check: Yes (iThenticate)
Conflict of Interest: The authors declared that, there are no conflicts of interest.
Complaints: hmj@hitit.edu.tr
Authorship Contribution: Idea/Hypothesis: NAA, BSY Design: BSY, ŞÖ Data Collection/Data Processing: NAA, ŞÖ, VH Data Analysis: VH, BSY Manuscript Preparation: NAA, VH, BSY.
Informed Consent: Written informed consent was obtained from all patients.
Financial Disclosure: There are no financial funds for this article.

Effect of Preanesthetic Assessment Timing on Preoperative Anxiety in Ambulatory Surgery Patients

ABSTRACT

Objective: Preoperative anxiety is a prevalent concern among ambulatory surgery patients. Besides controversial findings between preoperative anesthesia evaluation and anxiety in ambulatory surgical patients, its optimal timing on anxiety levels remains unclear. This study aimed to explore the impact of preoperative anesthesia evaluation timing on anxiety levels in patients undergoing ambulatory surgery.

Material and Method: A prospective, non-randomized, observational study was conducted between May 2016 and August 2016. Adult patients scheduled for elective surgery under local anesthesia with sedation were included. Participants were divided based on the timing of anesthesia evaluation: Group OP (evaluated before surgery) and Group AS (assessed on the day of surgery). Preoperative anxiety was measured using the Spielberger State-Trait Anxiety Inventory (STAI) and Visual Analog Scale (VAS) at two time points: just before preoperative anesthesia evaluation (Score 1) and immediately before surgery (Score 2).

Results: The study comprised 144 patients, with 72 in each group. No significant differences between groups were observed in baseline sociodemographic characteristics ($p>0.05$), except for significantly older patients in Group OP than those in Group AS ($p=0.030$). Median STAI-S, STAI-T, and VAS scores (Score 1) showed no significant differences between groups ($p>0.05$). Both groups significantly increased STAI-S scores between Score 1 and Score 2 measurements ($p=0.015$ for Group OP and $p<0.001$ for Group AS). Nevertheless, changes between Score-1 and Score-2 values of STAI-S scales were similar ($p=0.962$). STAI-S scores were significantly correlated with VAS scores separately in Groups OP and AS at two different time points ($p<0.05$).

Conclusion: The timing of preoperative anesthesia evaluation, whether conducted before or on the day of surgery, did not significantly affect preoperative anxiety levels in ambulatory surgery patients.

Keywords: Ambulatory surgical procedures, anesthetic assessment, preoperative anxiety, state-trait anxiety inventory, visual analogue scale.

ÖZET

Amaç: Preoperatif anksiyete, ambulatuvar cerrahi hastaları arasında yaygın bir endişe kaynağıdır. Ameliyat öncesi anestezi değerlendirmesi ile ambulatuvar cerrahi hastalarındaki anksiyete arasındaki tartışmalı bulgulara rağmen, bu değerlendirmenin anksiyete düzeyleri üzerindeki optimal zamanlaması belirsiz kalmaktadır. Bu çalışmanın amacı, preoperatif anestezi değerlendirmesi zamanının ambulatuvar cerrahi geçirecek hastaların ameliyat öncesi anksiyete düzeyleri üzerindeki etkisini araştırmaktır.

Gereç ve Yöntem: Mayıs 2016 ile Ağustos 2016 arasında, prospektif, non-randomize, gözlemsel bir çalışma planlandı. Lokal anestezi altında sedasyon ile elektif cerrahi planlanan yetişkin hastalar dahil edildi. Katılımcılar, anestezi değerlendirmesinin zamanlamasına göre iki gruba ayrıldı. Anestezi değerlendirmesi cerrahi gününden önce yapılan hastalar Grup OP ve cerrahi günü yapılan hastalar Grup AS olarak tanımlandı. Preoperatif anksiyete, preoperatif anestezi değerlendirmesinden hemen önce (Skor 1) ve cerrahiden hemen önce (Skor 2) olmak üzere iki farklı zaman diliminde Spielberger Durum-Sürekli Anksiyete Envanteri (STAI) ve Görsel Analog Skala (VAS) kullanılarak ölçüldü.

Bulgular: Çalışmada 144 hasta olup, her bir grupta 72 hasta bulunmaktadır. Gruplar arasında temel sosyodemografik özellikler açısından, Grup OP'de anlamlı olarak daha ileri yaşı olan hastalar olması dışında ($p=0,030$), anlamlı bir fark gözlenmedi ($p>0,05$). Medyan STAI-S, STAI-T ve VAS skorları (Skor 1) arasında gruplar arası anlamlı bir fark bulunmadı ($p>0,05$). Her iki grup da Skor 1 ve Skor 2 ölçümleri arasında STAI-S skorlarında anlamlı bir artış gösterdi (Grup OP için $p=0,015$ ve Grup AS için $p<0,001$). Yine de, Skor-1 ve Skor-2 değerleri arasındaki STAI-S ölçeklerindeki değişiklikler benzerdi ($p=0,962$). STAI-S skorları, iki farklı zaman noktasında Grup OP ve AS içinde ayrı ayrı VAS skorları ile anlamlı olarak korele olduğu saptandı ($p<0,05$).

Sonuç: Preoperatif anestezi değerlendirmesinin cerrahi öncesi veya cerrahi gününde gerçekleştirilmiş olmasının, ambulatuvar cerrahi hastalarındaki preoperatif anksiyete düzeyleri üzerinde anlamlı bir etkisi bulunmamaktadır.

Anahtar Sözcükler: Ambulatuvar cerrahi işlemler, anestezi değerlendirme, durum-sürekli anksiyete envanteri, görsel analog skala, preoperatif anksiyete.

Introduction

Preoperative anxiety, stemming from concerns about pain, surgery, unfamiliar surroundings, anticipation of incapacitation, loss of independence, and even mortality, poses a significant challenge (1–3). In the literature, the prevalence of preoperative anxiety in adult patients has been reported as high as 80%, emphasizing the importance of addressing related psychological and physiological aspects (1,4,5). Given the profound effects of preoperative anxiety on information retention, increased anesthetic requirements, and elevated risks of acute and chronic postoperative pain, various strategies, including premedication and informative interventions, have been proposed to manage its multifaceted effects (1,2,6).

Ambulatory surgery has gained popularity over the years in parallel with advances in perioperative anesthetic and surgical techniques (4,7). Preoperative anesthetic assessment has proven helpful in optimizing the preoperative medical status of surgical patients and improving overall care. On the other hand, day-case surgeries, which do not require a prior hospital visit, offer a potential solution to the challenges associated with facility capacity (8,9). However, there are concerns that anxiety and stress levels may be higher in ambulatory surgery patients due to inadequate pre-surgical information (10).

The optimal timing of various pharmacological and nonpharmacological anxiety interventions is unclear (6). A systematic review concluded that the timing of providing pre-surgical information had no significant impact on perioperative anxiety levels (11). In contrast, another study reported that a virtual reality experience immediately before the induction of anesthesia was more effective in reducing preoperative anxiety and distress levels in children compared to providing standard verbal information or performing interventions at outpatient clinics several days before the induction of anesthesia (2). Various studies highlighted the benefits of preoperative anesthesia consultation on anxiety levels (5,12). Additionally, several studies compared the outcomes of preoperative anesthesia given at different times and locations (13,14). However, findings in the literature on the relationship between preoperative anesthetic assessment and anxiety levels are contradictory. Moreover, none of these studies specifically addressed ambulatory surgery patients.

In this context, this study was carried out to determine the preoperative anesthetic assessment's impact on the anxiety levels of ambulatory surgery patients and its optimum timing based on this impact.

Material and Method

Study Design

This study was designed as a prospective, non-randomized, observational study. The Dokuz Eylül University Non-Interventional Research Ethics Committee approved the study protocol on 21.04.2016 (Approval number: 2016/11-14). The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all patients.

Population and Sample

The study population consisted of adult ambulatory patients scheduled for elective plastic and reconstructive surgery under local anesthesia with sedation in Dokuz Eylul University Hospital, Outpatient Surgical Unit, Izmir, Turkey, between May 2016 and August 2016. Patients who were not fluent in Turkish, had III or higher American Society of Anesthesiologists (ASA) physical status, psychiatric or neurological disorders, cooperation problems, impaired cognitive function, and long-standing alcohol use were excluded from the study. The sample was divided into two groups based on the timing of the preoperative anesthesia evaluation: Group OP consisted of the patients who were assessed at the outpatient clinics at least two days before the surgery, and Group AS consisted of the patients who were assessed in the ambulatory surgery unit on the same day of the surgery. The sample size was calculated based on the STAI scores of preoperatively informed patients (15). Accordingly, it was determined that each study group must have at least 63 patients, assuming a power of 95% and an alpha error of 0.05 to detect at least a 15% difference in the STAI scores. Considering a possible drop-out rate of 15%, we included 72 patients in each group. In the end, the study sample consisted of 144 patients. When the target number of 72 patients was reached in each group, the enrollment of new patients in the

study was terminated.

Preoperative Anesthetic Assessment

Per the institutional policy, all patients scheduled for surgery were instructed to visit the Department of Anesthesiology and Reanimation Outpatient Clinics at least two days before the surgery for a preoperative anesthetic assessment. Preoperative anesthetic assessments of patients who have not had a preoperative anesthetic assessment until the day of surgery are conducted by the anesthesia team in the Ambulatory Surgery Unit on the day of surgery.

Table I. Sociodemographic characteristics of the groups

	Group OP (n=72)	Group AS (n=72)	*p*
Age (year) †	40.5 [18.0 – 64.0]	33.0 [18.0 – 80.0]	***0.030****
Age groups ‡			
18-34 Years	28 (38.9)	38 (52.8)	*0.132***
35-50 Years	27 (37.5)	25 (34.7)	
>50 Years	17 (23.6)	9 (12.5)	
Sex ‡			
Female	31 (43.1)	32 (44.4)	*0.999***
Male	41 (56.9)	40 (55.6)	
Educational status ‡			
Primary school	12 (16.7)	15 (20.8)	*0.419***
High school	24 (33.3)	17 (23.6)	
University or higher	36 (50.0)	40 (55.6)	
Occupation ‡			
Worker	25 (34.7)	19 (26.8)	*0.065***
Self-employment	11 (15.3)	22 (31.0)	
Retired	16 (22.2)	12 (16.9)	
Housewife	14 (19.4)	7 (9.9)	
Student	6 (8.3)	11 (15.5)	
Marital status ‡			
Married	47 (65.3)	38 (52.8)	*0.175***
Single	25 (34.7)	34 (47.2)	
Smoking ‡	27 (37.5)	26 (36.1)	*0.999***
Previous anesthesia experience ‡	53 (73.6)	50 (69.4)	*0.712***
Number of operations †	1.0 [1.0 – 6.0]	1.0 [1.0 – 30.0]	*0.741**

Footnote: Table I displays the sociodemographic characteristics of the groups. The † symbol indicates values presented as median and range [Minimum-Maximum]. The ‡ symbol signifies that data are shown in number and percentage format (n (%)). Statistical test symbols are defined as follows: *. The Mann-Whitney U test compares median values between two independent samples. **. The Pearson Chi-Square test is employed to assess the significance of differences in categorical data across groups.

Anesthesia Procedure

A uniform anesthesia protocol featuring local anesthesia under sedation was applied to all patients instead of sedative premedication with anxiolytics. Sedative medications were administered to the patients by the attending anesthesiologists. Dosages were repeated when necessary. Attending surgeons were responsible for administering local anesthesia injections.

Table II. Intra and intergroup comparisons of the groups' STAI-State and Trait Anxiety and VAS scores

		Group OP (n=72)	Group AS (n=72)	*p**
STAI-S †				
	STAI-S-1	33.5 [20.0 – 53.0]	34.0 [20.0 – 57.0]	0.938
	STAI-S-2	38.0 [20.0 – 63.0]	38.5 [20.0 – 63.0]	*0.871*
	*p***	*0.015*	*<0.001*	
	Δ STAI-S †	2.5 [-18.0 – 35.0]	3.0 [-20.0 – 17.0]	*0.962*
STAI-T †				
	STAI-T-1	41.0 [22.0 – 60.0]	37.5 [26.0 – 54.0]	*0.051*
VAS †				
	VAS-1	20.0 [0.0 – 90.0]	25.0 [0.0 – 100.0]	*0.253*
	VAS-2	30.0 [0.0 – 100.0]	30.0 [0.0 – 100.0]	*0.766*
	*p***	***0.010***	*0.510*	
	Δ VAS †	0.0 [-90.0 – 90.0]	0.0 [-40.0 – 50.0]	*0.089*

Footnote: Table II provides intra and intergroup comparisons of the STAI-State and Trait Anxiety and VAS scores. The † symbol indicates that values are presented as median and range [Minimum-Maximum]. The STAI-S and STAI-T represent the State-Trait Anxiety Inventory for State and Trait anxiety, respectively, while VAS stands for Visual Analog Scale. Statistical test symbols are defined as follows: *. The Mann-Whitney U test compares median values between the two independent samples. **. The Wilcoxon test is employed to assess the significance of differences within groups.

Anxiety Level Assessment

The State-Trait Anxiety Inventory (STAI) developed by Spielberger et al. (16) and the Visual Analog Scale (VAS) (1,17) were used to assess patients' anxiety levels. Both tools were administered twice at two-time points: immediately before the preoperative anesthetic assessment (Time Point 1) and immediately before the surgery (Time Point 2).

STAI scale is a 4-point Likert-type scale consisting of two subscales, i.e., STAI-State (STAI-S) and STAI-trait anxiety (STAI-T), each comprising 20 items. While STAI-S reflects acute situational-driven anxiety at a particular moment, STAI-T assesses individual differences in anxiety proneness and a person's general anxiety levels (17, 18). Each item is assigned a score ranging from 1 (not at all) to 4 (very much so). A total score between 20 (no anxiety) and 80 (maximum anxiety) can be obtained from each STAI subscale (10, 12). The Turkish validity studies of the

scale were carried out by Oner and Le Compte (19). STAI-S and STAI-T scores above 44 are considered to indicate high preoperative and general anxiety levels (20).

Table III. Incidences of higher levels of preoperative and general anxiety in the groups.

		Group OP (n=72)	**Group AS** (n=72)	*p*
STAI-State ‡				
	High preoperative anxiety-1 (STAI-S-1, ≥45)	16 (22.2)	10 (13.9)	*0.279*
	High preoperative anxiety-2 (STAI-S-2, ≥45)	23 (31.9)	18 (25.0)	0.460
STAI-Trait ‡	High anxiety-1 (STAI-T-1, ≥45)	24 (33.3)	17 (23.6)	*0.268*

Footnote: Table III summarizes the incidences of higher levels of preoperative and general anxiety in the groups. The ‡ symbol signifies that data are shown in number and percentage format (n (%)). STAI-S and STAI-T represent the State-Trait Anxiety Inventory for State and Trait Anxiety, respectively. The Pearson Chi-Square test is used to assess the significance of differences in categorical data across groups.

In addition, within the scope of VAS, patients were asked to mark their anxiety levels on a scale ranging from 0 (no anxiety) to 100 (worst anxiety imaginable) (1, 17).

Table IV. Correlation analysis of STAI-S, STAI-T, and VAS scores in the study groups.

			Group OP		**Group AS**	
			r	*p*	r	*p*
STAI-S-1	-	**STAI-T-1**	*0.612*	***<0.001***	*0.435*	***<0.001***
STAI-S-1	-	**VAS-1**	*0.522*	***<0.001***	*0.628*	***<0.001***
STAI-T-1	-	**VAS-1**	*0.341*	***0.003***	*0.303*	***0.010***
STAI-S-2	-	**VAS-2**	*0.563*	***<0.001***	*0.747*	***<0.001***

Footnote: This table presents a correlation analysis between STAI-S (State-Trait Anxiety Inventory-State), STAI-T (State-Trait Anxiety Inventory-Trait), and VAS (Visual Analog Scale) scores across two study groups: Group OP and Group AS. The analysis utilizes Spearman's rho correlation coefficients to measure the strength and direction of associations between variables. Correlation coefficients (r) and significance levels (p) are reported for each pair of variables within each group, indicating how anxiety and pain perception measures interrelate in these specific patient cohorts.

Data Collection

Patients' sociodemographic (age, gender, marital, educational, and occupational statuses) and clinical (smoking status, alcohol consumption, previous anesthesia experience) characteristics were collected prospectively via a 10-to-15-minute face-to-face interview conducted by the same researcher. In addition, patients were administered STAI-S, STAI-T, and VAS at Time Points 1 and 2. The anesthesiologists who conducted the preoperative anesthetic assessment were blinded to patients' anxiety levels.

Statistical Analysis

Descriptive statistics obtained from the collected data were expressed as median with minimum and maximum values in the case of continuous variables, such as age and anxiety scores, i.e., STAI-S, STAI-T, and VAS scores, and as numbers and percentage values in the case of categorical variables, such as gender, educational status, and previous anesthesia experience. The normal distribution characteristics of the continuous variables were analyzed using the Shapiro-Wilk test. Non-normally distributed variables between the study groups were compared using the Mann-Whitney U test, i.e., Group OP and Group AS. Categorical variables with more than five expected counts were compared between the study groups using Pearson's chi-square test. Categorical variables with less than five expected counts in RxC tables were compared between the study groups using the Fisher-Freeman-Halton test. The differences in nonparametric anxiety scores assessed at two different time points were compared within the study groups using the Wilcoxon signed-rank test. Correlation analyses between these nonparametric variables were conducted using Spearman's Rho correlation coefficient. Jamovi project 2.3.28 (Jamovi, version 2.3.28.0, 2023, retrieved from https://www.jamovi.org), and JASP 0.17.3 (Jeffreys' Amazing Statistics Program, version 0.17.3, 2023, retrieved from https://jasp-stats.org) software packages were used in the statistical analyses. Probability (p) statistics of < 0.05 were deemed to indicate statistical significance.

Results

One hundred and forty-four patients included in the study sample were divided into Group OP and Group AS, with 72 patients in each group. The median age of the patients in Group OP was significantly higher than in Group AS (40.5 years vs.33.0 years, *p=0.030*). However, a comparison of the groups according to age groups revealed no significant

difference between the groups (*p=0.132*). There was no significant difference between the groups in other baseline sociodemographic characteristics (*p>0.05*) (Table 1).

There was no significant difference between the groups in the STAI-S and STAI-T scores assessed at Time Point 1 (*p=0.938* and *p=0.962*, respectively). On the other hand, the median STAI-S score assessed at Time Point 2 was significantly higher than the median STAI-S score assessed at Time Point 1 in both groups (*p=0.015* for Group OP and *p<0.001* for Group AS). There was no significant difference between the groups in terms of the change in median STAI-S scores assessed at Time Points 1 and 2 (*p=0.962*) (Table 2).

There were no significant differences between the groups in VAS scores assessed at Time Points 1 and 2 (*p>0.05*). In Group OP, the VAS score assessed at Time Point 2 was significantly higher than the VAS score assessed at Time Point 1 (*p=0.010*). There was no significant difference between the VAS scores assessed at different time points in Group AS (*p=0.510*). There was no significant difference between the groups in terms of the change in VAS scores assessed at Time Points 1 and 2 (*p=0.089*) (Table 2).

The rate of patients with high preoperative anxiety levels according to STAI-S scores measured at different time points was higher, albeit not significantly, in Group OP than in Group AS (p>0.05). There was also no significant difference between the groups in the rate of patients with high general anxiety levels (*p=0.268*) (Table 3).

The correlation analysis revealed significant correlations between STAI-S, STAI-T, and VAS scores in Groups OP and AS at different time points (*p<0.05*) (Table 4).

Discussion

The study findings indicated that the timing of preoperative anesthetic assessment—whether conducted before the day of surgery (Group OP) or on the day of surgery (Group AS)—did not significantly impact the preoperative anxiety levels as measured by the STAI-S STAI-T, and VAS scores. The lack of significant differences in STAI-S and STAI-T scores between the groups at the first time point indicated that the initial anxiety levels were similar regardless of the timing of the anesthesia evaluation. In other words, the location and the timing of preoperative anesthetic assessment, whether conducted several days before surgery or on the day of surgery, had no significant impact on preoperative and general anxiety levels in ambulatory surgery patients.

Several studies investigated the relationship between the location and timing of preoperative anesthetic assessment and various aspects of surgical treatment, such as perioperative anxiety levels, cancellation of surgery, and identification of previously unidentified risky medical conditions (2, 5). A limited number of studies have attempted to demonstrate the effect of optimal timing of pre-anesthesia consultation on reducing perioperative anxiety levels in surgical patients (13, 14). In one of these studies, Arellano et al. (14) compared three groups in which the anesthetic assessment was performed at three different times and locations, i.e., in the outpatient clinic a week before surgery, at the bedside upon admission to the hospital, and just outside the operating room immediately before surgery, in terms of perioperative anxiety levels. Consequently, they found that conducting the anesthetic assessment just outside the operating room immediately before surgery significantly reduced patient's anxiety levels. In contrast, Twersky et al. (13) did not find any significant difference in preoperative and postoperative anxiety scores between ambulatory surgical patients whose anesthetic assessments were performed early or on the day of surgery. They found that STAI-T scores did not differ significantly between ambulatory surgical patients whose anesthetic assessments were performed early or on the day of surgery. Similarly, the groups in the current study did not differ in STAI-S scores at either of the two-time points. Our findings also showed that initial anxiety levels, measured both immediately before the preoperative anesthetic assessment and immediately before surgery, were unaffected by the timing of the assessment. Therefore, we believe that the contradictory results regarding the impact of the location and timing of preoperative anesthetic assessments on various aspects of surgical treatment, particularly on patients' anxiety levels, may be due to differences in study designs and patient populations.

Porcar et al. (5) found the rate of patients with high anxiety levels decreased, as evidenced by the decrease in STAI scores after anesthesia consultation. However, although most (72%) of the patients in their sample underwent ambulatory surgery using regional anesthesia, some patients were scheduled for different types of surgery and anesthesia. They stated that giving personal attention to patients and displaying a reassuring attitude helped reduce patients' anxiety levels (5). Akhlaghi et al. (12) demonstrated the positive effect of preoperative anesthetic consultation in reducing preoperative anxiety levels of patients undergoing oral and maxillofacial surgery. Although the STAI was used to assess patients' anxiety levels in these studies (5, 12–14), there were significant differences in terms of the STAI versions used and how the scores were evaluated. To give an example, Porcar et al. (5) used the authors used the short version of the STAI, whereas Akhlaghi et al. (12) used six different severity categories for anxiety based on the total STAI-S and STAI-T scores. In comparison, we separately evaluated the STAI-S and STAI-T scores to assess patients' preoperative and general anxiety levels. In addition, instead of using different severity categories for anxiety, we divided the patients into only two categories based on the definition that an STAI score above 44 indicates high preoperative and general anxiety levels (17,20). This grouping revealed that the proportion of patients with high preoperative anxiety levels, as indicated by STAI-S scores at different time points, was higher in Group OP than in Group AS. However, this difference was not statistically significant. This trend could indicate a potential benefit of same-day assessment in reducing preoperative anxiety, though further research with larger sample sizes might be needed to confirm this observation.

It has been reported in the literature that patients' preoperative anxiety is at its highest level just before being transferred to the operating room (2,13,14). Consistent with this, our study found that both groups showed a significant increase in median STAI-S scores from Time Point 1 to Time Point 2, indicating rising anxiety as surgery approached. However, the magnitude of this change did not differ significantly between the groups, suggesting that while anxiety naturally increases closer to the time of surgery, the timing of the anesthetic assessment did not differentially influence this increase. Contrary to the findings in the literature that a visit by an anesthetist may reduce patients' anxiety levels, we did not find a significant effect of anesthesia consultation on the day of surgery on patients' anxiety levels (14). The short interval between preoperative anesthetic assessment and ambulatory surgical procedures, especially in Group AS, may have prevented the detection of a significant impact.

There are various tools used to assess the anxiety levels of patients, the most commonly used being the STAI. However, the fact that STAI consists of 20 multiple-choice items limits its usability at the bedside (21). The efficacy of VAS as a consistent, simple, and objective tool in assessing anxiety has been demonstrated in the literature (20–23). In parallel, in this study, we used VAS, alongside STAI, to assess the anxiety levels of the patients. Consequently, as in other studies (21), we detected significant correlations between the STAI and VAS scores. The significant correlations observed between STAI-S, STAI-T, and VAS scores across both groups at different time points underscore the robustness of these anxiety measures in reflecting patients' emotional states. Notably, based on VAS scores, we observed a heightened anxiety as surgery approached, but only in Group OP. This suggests that same-day assessment might help mitigate the escalation of anxiety. However, the change in VAS scores between the two time points was not significantly different between the groups, further emphasizing that the assessment timing did not substantially impact anxiety levels. Therefore, we concluded that VAS alone could be a reliable tool for assessing patients' preoperative anxiety levels. Age is considered a potential confounding factor in the assessment of preoperative anxiety among surgical patients (24). Comorbidities and frailty associated with aging may compromise older patients' physiological reserves, potentially increasing their vulnerability to anesthesia and surgery (24,25). While younger adults might also experience preoperative anxiety for different reasons, anesthesia and surgery are significant risk factors for anxiety across age groups. Previous studies on the timing of anesthesia

evaluation have generally reported that age is not a major risk factor for anxiety (3,5,12). However, our study found that patients in Group OP were significantly older than those in Group AS. Although the differences between age groups were not statistically significant, older patients (>50 years) were more commonly found in Group OP, while younger patients (18-34 years) were more prevalent in Group AS. This suggests that as age increases, the risk of preoperative anxiety might also increase. Further large-scale studies are needed to understand better the potential association between age and preoperative anxiety levels.

This study's strengths include assessing patients' anxiety levels at different time points and operating all patients in the same surgical department, which allowed ruling out the confounding effect of varying scheduling practices applied by different outpatient clinics. On the other hand, the fact that the intervals between preoperative anesthetic assessment and surgery were not standardized between the groups is the study's primary limitation. The variability in the time between assessment and surgery could affect anxiety levels differently across patients, potentially introducing variability that could obscure the impact of the timing of the anesthetic assessment. The significantly older age of patients in Group OP compared to Group AS could be a confounding factor influencing preoperative anxiety levels. Prospective studies with more homogeneous demographic characteristics would clarify this issue. Additionally, the study's design as a non-randomized observational study limits the ability to draw causal conclusions. The lack of randomization might introduce selection bias, as patients who chose or were assigned to different timing of assessments could differ in ways not controlled for in the analysis. Lastly, the study was limited to patients undergoing elective plastic and reconstructive surgery under local anesthesia with sedation. This specificity may limit the generalizability of the findings to other types of surgeries or anesthetic approaches.

In conclusion, the study's findings indicated that the location and timing of preoperative anesthetic assessment, whether conducted several days before or on the day of surgery, had no significant impact on preoperative anxiety levels in ambulatory surgery patients. This insight challenges prevailing assumptions in perioperative care practices and underscores the complexity of preoperative anxiety as a multifactorial phenomenon. The consistent increase observed in patients' anxiety levels as the time of surgery approached, regardless of the timing of the preoperative anesthetic assessment, suggests that patients' anxiety may be more deeply rooted in the anticipation of surgery rather than the setting of the preoperative anesthetic assessment.

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