

# Incidence and features of preoperative anxiety in patients undergoing elective non-cardiac surgery

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The study was conducted at the Centre of Anaesthesiology, Intensive Care and Pain Management of Vilnius University Hospital Santaros Klinikos.

**Background.** Due to its implications on postoperative outcomes and patient satisfaction, anxiety evaluation should be incorporated in the preoperative assessment of the patients.

**Materials and methods.** A series of consecutive patients undergoing elective surgery were included in the study. Preoperative anxiety was evaluated using the Hospital Anxiety and Depression Scale (HADS), the Amsterdam Preoperative Anxiety and Information Scale (APAIS), and the Visual Analogue (Face) Scale (VAFS). Qualitative and quantitative analyses were used to describe features of anxiety.

**Results.** 149 patients were included in the study, of whom 40.9% were scheduled for low, 47.7% for intermediate, and 11.4% for high-risk procedures. Based on HADS, 19 patients (12.6%) were positive for anxiety. VAFS revealed that 10.3% of patients experience medium/high intensity of anxiety. Patients were mostly concerned about the success (29.3%) and complications (11.4%) of the surgery. APAIS score analysis revealed significantly higher anxiety ( $p < 0.01$ ) and a need of information ( $p < 0.01$ ) about surgery compared to anaesthesia. In contrast to age, education, or previous surgery, anxiety was associated with female sex ( $p < 0.01$ ), surgical risk ( $p = 0.02$ ), and subjective health evaluation ( $p < 0.01$ ).

Patients tended to choose a conversation with the doctor (45.6%) or a relative (44.8%) as a measure to relieve anxiety, and 18.4% would choose medication. Praying, music therapy, massage, or even sexual intercourse were among the measures suggested by patients.

**Conclusions.** A significant part of patients experience anxiety before surgery, predominantly about the success of the surgery. According to the patients, conversation is the best option to reduce anxiety.

**Keywords:** anxiety, elective surgical procedures, noncardiac

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## INTRODUCTION

Patients admitted to hospital for surgery usually experience a certain level of anxiety. The psychoemotional status affects quality of the preoperative visit, anaesthesia induction and maintenance (1). Anxiety has been associated with worse postoperative recovery and outcomes, including increased post-surgical pain, impaired wound healing, and poor satisfaction (2–5). Given these points, a recent update on the Guidelines of the European Society of Anaesthesiology recommends incorporating anxiety evaluation into preoperative assessment of the patients (6).

Preoperative anxiety can be assessed by several approaches. Yet using anxiety questionnaires is not widely accepted in clinical practice, possibly due to high workload of anaesthesiologist and time restrictions during preoperative visit or underestimation of patient concerns (5).

The main objective of our study was to calculate the incidence of preoperative anxiety in non-cardiac surgery patients and to investigate the causes and management strategies of anxiety.

## MATERIALS AND METHODS

A series of consecutive adult patients undergoing elective non-cardiac surgery were included in the study. The study was approved by Vilnius University Hospital Santaros Klinikos institutional review

board. A verbal informed consent was obtained from the patients as well.

For preoperative anxiety evaluation, we used the Hospital Anxiety and Depression Scale (HADS) and the Visual Analogue (Face) Scale (VAFS). The Amsterdam Preoperative Anxiety and Information Scale (APAIS) was used to differentiate anxiety related to anaesthesia and to the surgical procedure itself. Five-point Likert type scale (where 1 is “very poor” and 5 is “excellent”) was used to evaluate overall health and the effect of anaesthesiologist’s preoperative visit on the anxiety level. Multiple choice answers and open questions were used to investigate the causes of anxiety and measures to reduce it.

Qualitative and quantitative analyses, including descriptive statistics, were used to describe the data. The data was compared using cross tabs, t-test, the Mann-Whitney-U test, ANOVA, the Kruskal-Wallis test and Spearman correlation, depending on the type and normality of the data;  $p < 0.05$  was considered significant.

## RESULTS

The study included 149 patients, the majority of whom – 61.7% – were female (Table 1). The patients were mostly scheduled for low and intermediate risk surgery, 40.9% and 47.7%, respectively; 11.4% of the patients were appointed for a high-risk procedure.

**Table 1.** Baseline characteristics and incidence of anxiety (based on HADS score) in study participants

Preoperative characteristic	n (%) or median (range)	Incidence of anxiety	p value
Sex: female	92 (61.7%)	19.6%	<0.01
male	57 (38.3%)	3.5%	
Age, years	57 (18–87)	–	–
Family status: married/has a partner	102 (68.5%)	33.3%	0.10
divorced	10 (6.7%)	38.1%	
single	17 (11.4%)	23.8%	
widow/er	19 (12.7%)	4.8%	
not known	1 (0.7%)	0%	
Education: lower secondary	6 (4.0%)	5%	0.64
secondary	48 (32.2%)	35.0%	
vocational secondary	31 (20.8%)	30.0%	
higher	63 (42.3%)	30.0%	
not known	1 (0.7%)	0%	

Table 1. (continued)

Preoperative characteristic	n (%) or median (range)	Incidence of anxiety	p value
Surgery risk: low	61 (40.9%)	12.7%	<0.01
intermediate	71 (47.7%)	8.6%	
high	17 (11.4%)	42.8%	
Residence location: urban	123 (82.6%)	14.4%	0.49
rural	26 (17.4%)	11.5%	
Had anaesthesia previously: yes	124 (83.2%)	14.4%	0.52
no	25 (16.8%)	12.0%	
Health: excellent	13 (8.7%)	7.7%	<0.01
good	60 (40.3%)	3.4%	
medium	65 (43.6%)	18.2%	
poor	11 (7.4%)	54.6%	
very poor	0 (0%)	0%	
Hospitalized on: day of the surgery	32 (21.5%)	0%	0.03
day before	103 (69.1%)	17.3%	
several days before	13 (8.7%)	23.1%	
not known	1 (0.7%)	0%	
Preoperative pain: yes	44 (29.7%)	22.7%	0.06
no	105 (71.3%)	10.4%	
Sleep disturbances: yes	21 (14.1%)	33.3%	0.02
no	124 (85.9%)	10.8%	
Already visited by anaesthesiologist: yes	54 (36.2%)	7.0%	0.14
no	95 (63.8%)	16.8%	

Based on HADS, 30 patients (20.1%) had borderline and 19 (12.6%) abnormal anxiety test results. VAFS revealed that 10.9% of patients were experiencing medium to high intensity of anxiety. The median APAIS score for anxiety reached 11 (available range 4–20) and the median score for information need was 6 (available range 2–10). The APAIS anxiety score greater than 10 was recorded in 57.7% of the participants.

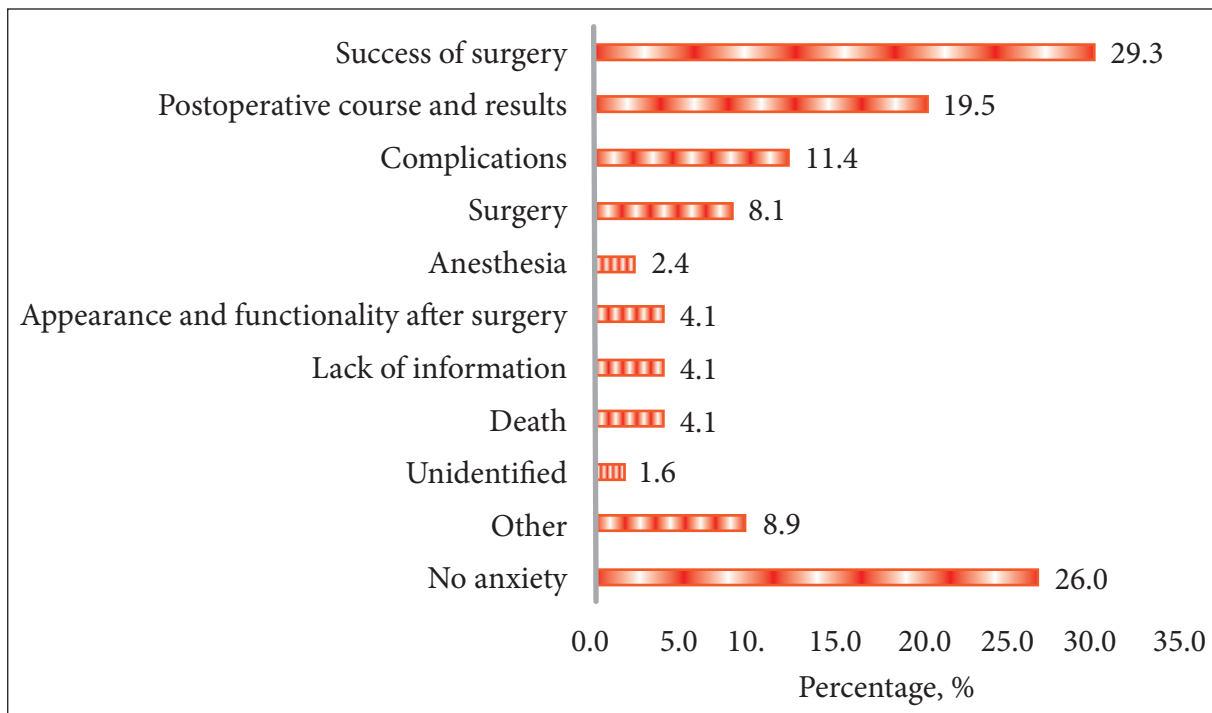
The leading cause of preoperative anxiety was the success of surgery (29.3%), followed by the postoperative course (19.5%), and complications during/after the procedure (11.4%) (Figure 1). Several patients expressed concerns about their postoperative looks and the loss of independence, that is, the ability to speak, walk, or use the bathroom without assistance. Other causes of preoperative anxiety ranged from the distress about the postoperative period to the fear of dying during surgery. The so-called “famous” fears of awareness during the surgery or of foreign bodies left inside represent only a minority of cases. Finally, 26.0%

of participants claimed no anxiety, but in most cases their subjective answers did not correspond with questionnaire results.

APAIS score analysis revealed significantly higher anxiety (9.6 vs. 7.9,  $p < 0.01$ ) and need of information (3.6 vs. 3.0,  $p < 0.01$ ) about surgery compared to anaesthesia.

A higher incidence of anxiety was found in females than in males (19.6% vs. 3.5%,  $p < 0.01$ ) (Table 1). Age was comparable between anxious and non-anxious patients (52.9 vs. 58.1,  $p = 0.21$ ). Neither education, family status, living in an urban/rural area, nor a history of previous surgery or preoperative pain were associated with a higher incidence of anxiety. Higher incidence of anxiety was noticed in patients hospitalized one or more days before surgery ( $p = 0.03$ ) and in those with sleep disturbances (33.3% vs. 10.8%,  $p = 0.02$ ).

The APAIS anxiety score correlated with subjective evaluation of health ( $r = -0.31$ ,  $p < 0.01$ ). Similarly, high-risk surgery patients had an increased incidence of anxiety compared with

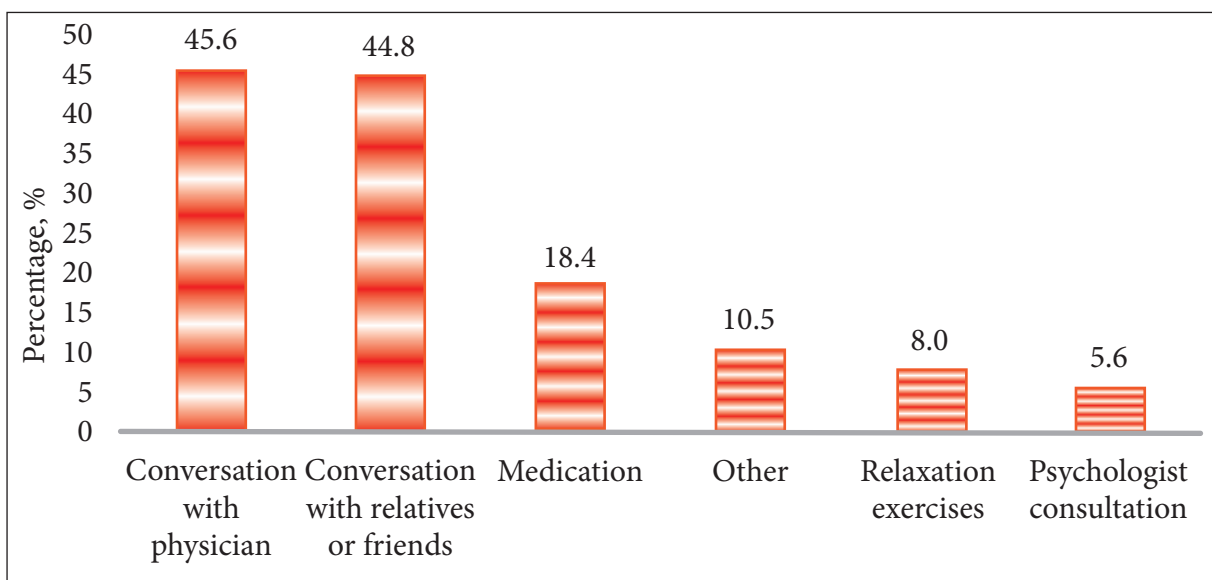


**Fig. 1. Causes of preoperative anxiety.** “Appearance and functionality” include being able to talk, walk, and use the bathroom, and formation of colostomy. “Other” include: waiting for the procedure, awareness during the surgery, collapsing during spinal anaesthesia, loss of control during general anaesthesia, foreign bodies left inside, the surgeon’s mood and wellness, family, dinner time

intermediate- (42.8% vs. 8.6%,  $p = 0.01$ ) and low-risk procedures (42.8% vs. 12.7%,  $p = 0.02$ ).

Patients tended to choose a conversation with a doctor (surgeon or anaesthesiologist) (45.6%) or relatives/friends (44.8%) as a measure to re-

lieve anxiety (Fig. 2). However, only 34.9% in fact discussed their concerns with a specialist. Medication was chosen by 18.4% of the patients, relaxation exercises by 8.0%, and psychologist’s consultation by 5.6%. Patients also suggested time alone,



**Fig. 2. Anxiety management strategies according to study participants.** “Other” include music, massage, time alone, praying, sweets, sexual intercourse

praying, music therapy, massage, sweets, or even sexual intercourse.

## DISCUSSION

A certain level of anxiety is a universal feature in the preoperative setting. The incidence of anxiety varies from 8% to more than 80% (7–10). Such variance in the incidence is mainly explained by different tools and methods used to diagnose preoperative anxiety. This effect is obvious in our study: 57.7% had anxiety according to the APAIS anxiety score (when the cut-off value is 10), whereas only 12.6% of patients were diagnosed with anxiety based on the HADS scale. When comparing studies based on the test used, similar proportions of anxious patients are found irrespective of the geographical region (7, 8, 11, 12).

In concordance with previous studies, we found that female patients were associated with higher anxiety scores (9, 13). As in our study, most of the evidence does not confirm age as a risk factor for preoperative anxiety (10, 12, 14).

Patients from rural areas have been linked to a higher incidence of anxiety, allegedly due to self-consciousness, different communication skills, and a lower tendency to seek information (15). However, our results did not show such a distinction between urban and rural residents. Better educated individuals are considered to be more aware of the risks of surgery and capable of expressing their concerns more precisely, which leads to increased anxiety (13). Again, no such relationship was found in our study.

On the other hand, anxiety was significantly more common among the participants scheduled for high-risk surgery compared to intermediate- or low-risk procedures. Not necessarily this is related to the fear of a complex procedure as such. Often patients are worried about impairment of functionality after surgery, including pain, formation of stoma, incontinence, etc. (16). This corresponds well with our findings: a quarter of the participants expressed their concerns about the postoperative period and their functional status after surgery.

Although not an original finding, it was interesting to notice that, based on APAIS score (14), patients were more concerned about surgery than about anaesthesia. In contrast to anaesthesia, sur-

gery is often perceived as a direct solution to a patient's disease. Therefore a greater need for information about surgery is understandable.

The participants chose a conversation with a specialist as the best option to reduce anxiety. But in fact, they rarely (37.8%) disclosed their concerns to a physician. Potential reasons included high workload of the specialist leaving limited time for a conversation, embarrassment of asking "stupid" questions, or the belief that the psychological state of a patient was not the physician's concern. Some of the participants assumed that more information would even increase their anxiety. Importantly, since there is a certain degree of distrust in medical specialists in Lithuania, part of the patients turned to their family members, friends, or the patients in the same ward for information or sought it online (9).

Similar preoperative fears were identified between our study participants and those from a different regional or ethnic background. This confirms not only the universal nature of preoperative anxiety, but also general concerns about surgery success, complications, death, or postoperative results (7, 10, 11, 14, 17).

At the same time several differences occurred. Patients from low-income countries expressed the fear of death, complications, medical negligence of the staff, loss of family, interventional procedures (i.e., needle punctures), or simply the fear of unknown origin much more often (7, 18). The fear of death or of failure to recover after anaesthesia is also common among western societies, but to a lesser extent. Patients in economically developed countries experience anxiety about the loss of control/awareness of what is happening, waiting for surgery, results of the procedure (11, 14).

Like in the developed countries, the participants in our study were relatively only slightly concerned about death or interventional procedures, or could not identify the cause for anxiety. On the other hand, large part of anxiety was caused by possible complications, a feature more common in the low-income countries. Success of surgery and fear of complications likely reflects a certain distrust in medical services or in the competence of medical staff (17). Distrust could also be enhanced by prejudices, especially in the countries less economically strong where the level of education is often poor.



A study of Blazevičiute et al. described fear of medical expenses as a unique feature of the Lithuanian population (17), despite social insurance covering treatment costs. This might be related to illegal payments and a lack of transparency in the health sector. At the same time, temporary inability to work affects the family budget and causes indirect expenses.

When it comes to reducing anxiety, non-pharmacological measures are the most popular. The majority of the participants chose a conversation with a physician or a relative/friend as the best strategy to manage anxiety. Information-based patient education and preoperative psychological intervention have shown positive results in reducing anxiety (4, 16, 18–20). Introducing patients to pain management and provision of clear instructions about the postoperative period could reduce concerns about postoperative course (19).

Psychologists have been gaining in popularity in intensive care and oncological units. Psychological consultation was not a preferable choice to the participants in the study, possibly due to a stigma that mental health specialists still carry in our society. Patients also might consider anxiety as inevitable part of preoperative period rather than a disorder requiring professional help. Up to 75% of patients from lower-income economies choose talking to another patient when coping with anxiety (7, 12). Although less frequently, for the reasons discussed above our patients also sought advice from other patients, relatives or friends.

One patient indicated praying as reducing anxiety, since praying is related with positive feelings, hope, and solace. Patients frequently turn to praying when anxious in societies where religious beliefs play an important role, especially in Latin America and Africa (7, 12).

Aromatherapy, massage, music therapy, virtual reality, even acupuncture are relatively safe, effective, and enjoyable options to reduce preoperative anxiety (13, 21–23). Only a small proportion of our patients indicated some of these methods to reduce anxiety. Unfamiliarity with a method, doubts about its effectiveness, or technical difficulties along with the resistance of the medical personnel to unconventional techniques could be responsible for the result.

Less than 20% of our patients would have preferred anxiolytic medication, probably due to the

side effects. However, drugs could have a place in anxiety management when non-pharmacological measures fail and anxiety level is high. Disturbed sleep was associated with preoperative anxiety not only in our study (13), therefore premedication also could have a role here.

## CONCLUSIONS

A significant part of patients experience anxiety before surgery. Predominantly they are concerned about the success of the surgery, feel uncertainty about the postoperative period, possible complications, and a lack of information on the postoperative course. When reducing anxiety, medication is a less appealing option to the patients than a conversation with a physician and relatives or friends.

## CONFLICT OF INTEREST

None declared.

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### PACIENTŲ, KURIEMS ATLIEKAMOS PLANINĖS NEKARDIOCHIRURGINĖS OPERACIJOS, PRIEŠOPERACINIO NERIMO ĮVERTINIMAS

#### *Santrauka*

**Įžanga.** Nerimas prieš operaciją turi įtakos pooperacinei pacientų būklei ir savijautai. Todėl tiriant pacientus prieš operaciją rekomenduojama vertinti ne tik jų fizinę sveikatą, bet ir nustatyti nerimo lygį.

**Metodika.** Į tyrimą paėliui įtraukti pacientai, hospitalizuoti planinei nekardiochirurginei operacijai. Priešoperacinis nerimas įvertintas naudojant hospitalinę nerimo ir depresijos skalę (HNDS), Amsterdamo priešoperacinio nerimo ir informacijos skalę (APNIS) ir vizualiųjų analogų (veidukų) skalę (VAVS). Analizei naudoti kiekybiniai ir kokybiniai duomenų apdorojimo metodai.

**Rezultatai.** Tyrime dalyvavo 149 pacientai. 40,9 % jų buvo numatytos mažos, 47,7 % – vidutinės ir 11,4 % – didelės rizikos operacijos. Pagal HNDS rezultatus, 19 pacientų (12,6 %) diagnozuotas nerimo sutrikimas. Vidutinio ir didelio lygio nerimą jautė

10,3 % pacientų, vertinant pagal VAVS. Dažniausiai pacientai jaudinosi dėl operacijos sėkmės (29,3 %) ir galimų komplikacijų (11,4 %). APNIS klausimyno rezultatai parodė, kad pacientai jaučia reikšmingai didesnę nerimą dėl operacijos nei anestezijos ( $p < 0,01$ ) bei norėtų daugiau sužinoti apie operaciją nei anesteziją ( $p < 0,01$ ). Priešoperacinis nerimas susijęs su moteriškąja lytimi ( $p < 0,01$ ), operacijos rizika ( $p = 0,02$ ) ir subjektyviu sveikatos įverčiu ( $p < 0,01$ ). Nei amžius, nei išsilavinimas ar buvusių operacijų anamnezė įtakos nerimui neturėjo.

Pacientų manymu, geriausiai nerimą mažintų pokalbis su gydytoju (45,6 %) ar artimaisiais (44,8 %). Vaistus nerimui mažinti rinkęsi 18,4 % pacientų. Iš kitų nerimui mažinti priemonių pacientai paminėjo muzikos terapiją, meldimąsi, masažą ar net seksualinius santykius.

**Išvados.** Nemaža dalis pacientų jaučia nerimą prieš operaciją, dažniausiai dėl operacijos sėkmės. Anot tiriamųjų, geriausiai nerimą sumažintų pokalbis su gydytoju ar artimaisiais.

**Raktažodžiai:** nerimas, planinė operacija, nekardiochirurginė operacija