ORIGINAL ARTICLE

EVALUATION OF ANXIETY IN PREOPERATIVE PATIENTS:

State-Trait Anxiety Inventory Instrument (STAI)

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Highlights:
(1) The study revealed differences in anxiety levels between the groups analyzed.
(2) Preoperative care should involve welcoming, bonding, and quality care.
(3) Anxiety and integrating the multidisciplinary team are essential for effective care.

ABSTRACT

Objective: To assess levels of state and trait anxiety in preoperative patients admitted to the Surgical Unit of a hospital located in the extreme south of Brazil. *Method:* This quantitative, exploratory-descriptive study was conducted with 50 preoperative inpatients. Data were collected using the State-Trait Anxiety Inventory (STAI), translated and adapted for use in Brazil. Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 22.0.2. Descriptive statistics were applied, and a t-test was performed to compare state and trait anxiety according to sex. *Results:* Trait anxiety scores were higher than state anxiety scores. Most participants exhibited trait anxiety rather than state anxiety, indicating that these preoperative patients already showed an anxious profile – that is, they possessed personality traits more prone to the development of anxiety. *Conclusion:* These findings are relevant to clinical nursing practice, considering that when professionals identify patients with anxiety symptoms, they must plan interventions that contribute to a calmer perioperative period and support postoperative recovery.

Keywords: nursing; anxiety; surgicenters.

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INTRODUCTION

Anxiety is common among patients undergoing medical treatment and is characterized as an alert response to situations perceived as potentially threatening[1]. In this context, patients awaiting surgical intervention during the preoperative period often experience significant emotional distress[2].

Signs of anxiety are typically characterized by restlessness and concern related to illness, hospitalization, anesthesia, surgery, or fear of potential outcomes. Anxiety heightens the stress response and may trigger a physiological reaction involving the release of neuroendocrine mediators, which can negatively impact the surgical procedure, anesthesia, postoperative recovery, or even the length of hospital stay[1].

Anxiety affects approximately 40% to 76% of patients during the preoperative period[3]. However, its prevalence does not justify neglect. The preoperative phase is as important as the surgery itself, as it involves a series of procedures and actions to ensure surgical safety, including completing medical records and consent forms, identifying the patient and noting allergies or risk factors, verifying fasting status, administering pre-anesthetic medication and reviewing test results, as well as removing prostheses, jewelry, and nail polish, performing body hygiene, shaving, and drying hair when necessary[2].

Such care procedures fall within the scope of the perioperative nursing consultation and are part of a set of interventions that include clinical assessment, patient education, clarification of doubts, and physical and emotional preparation[4]. This approach has proven effective in promoting earlier recovery of autonomy after the procedure and contributing to a more positive surgical experience by reducing stress levels[5]. Considering that individuals express their feelings and emotions through speech, therapeutic listening fosters acceptance, support, and comfort, helping to relieve anxiety and build a trusting relationship between the nurse and the patient[2].

Alongside the nursing consultation, it is essential to plan individualized, evidence-based care[2] using multiple strategies to reduce anxiety. This includes the involvement and participation of the entire multidisciplinary team, contributing to positive surgical outcomes[6].

There are several theoretical models that can be used to analyze anxiety without necessarily characterizing it as an anxiety disorder. These include the Hospital Anxiety and Depression Scale (HADS), the Penn State Worry Questionnaire (PSWQ), the Self-Reporting Questionnaire-20 (SRQ-20), and the State-Trait Anxiety Inventory (STAI)[7-8]. The latter was developed in 1970[9] and subsequently translated and adapted for use in Brazil in 1977[10]. It is one of the most widely used tools for quantifying subjective symptoms related to anxiety, as it assesses both trait and state anxiety and, unlike some other instruments, is not limited to use by psychology professionals.

This topic is highly relevant to the healthcare field, particularly in nursing care, as it is through the care provided that signs and symptoms of anxiety can be identified—contributing to comprehensive patient care and reducing the risk of complications during hospitalization. Accordingly, this study aims to assess the levels of state and trait anxiety among preoperative patients admitted to the Surgical Unit of a hospital located in the extreme south of Brazil.

METHOD

This quantitative, exploratory-descriptive study was conducted in collaboration with the Surgical Unit of a University Hospital located in the extreme south of Brazil, between January and June 2022. The Surgical Unit comprises 10 sex-separated wards, totaling 32 beds. It admits patients in both the preoperative and postoperative periods for various types of surgeries, including cholecystectomy, herniorrhaphy, and hysterectomy, among others.

The study participants were inpatients receiving preoperative care, with surgery scheduled for the day following the interview, and who agreed to participate in the study. A free and informed consent form was signed by each participant and, in the case of minors, by their legal guardians; verbal assent was also obtained from the minors. To ensure confidentiality, participants were identified using sequential Arabic numerals for data processing purposes. Inclusion criteria were: being hospitalized in the unit, receiving preoperative care, having a completed preoperative checklist, and having medical records available in the unit. Exclusion criteria included missing information in the inpatient checklist or medical records.

Non-probabilistic convenience sampling was used to select participants, meaning that sample elements were not chosen randomly but rather based on the characteristics of the study group[11]. Thus, the participants were selected according to their presence and availability at the site and time of data collection.

According to data from the hospital's Bed Regulation sector, the Surgical Unit averaged 115 hospitalizations per month between January and July 2019. Based on this total, the sample size was calculated using the StatCalc tool in EpiInfo version 7.2, with a 95% confidence level, resulting in a minimum required sample of 84 participants.

Data collection began in December 2019. However, due to the Covid-19 pandemic, the study was interrupted to comply with the infection prevention and control measures established by the World Health Organization starting in March 2020. With the gradual decline in case numbers and deaths, as well as the widespread vaccination of the population, the study resumed, and data collection took place from January to June 2022.

The extended data collection period was necessary due to the gradual resumption of surgical procedures, which made it difficult to reach the initially expected sample size. As a result, 59 individuals were considered for participation in the study; however, there was one dropout and eight refusals, leading to a final total of 50 questionnaires administered.

The data collection instrument used was the STAI[9], which had been translated and adapted for use in Brazil. It consists of two subscales. The first, the State Anxiety Scale, assesses the individual's current anxiety state, asking how respondents feel at that specific moment and using items that measure subjective feelings of apprehension, tension, nervousness, worry, and activation or alertness of the autonomic nervous system. The second, the Trait Anxiety Scale, evaluates relatively stable aspects of anxiety proneness, including general states of calmness, confidence, and security[10].

Each scale (State and Trait Anxiety) consists of 20 items rated on a 4-point scale, with total scores ranging from 20 to 80. The State Anxiety subscale assesses current feelings, with response options as follows: 1) not at all, 2) a little, 3) moderately, and 4) very much. The Trait Anxiety subscale evaluates the general frequency of such feelings, with the following options: 1) almost never, 2) sometimes, 3) often, and 4) almost always[10].

Each response is assigned a score, with reversed scoring applied to positively worded items (e.g., if the patient selects 4, the score is recorded as 1). The following cutoff points are used to determine anxiety levels: 20 to 30 points indicate a low level of anxiety; 31 to 49 points, a moderate level; and 50 or more points, a high level of anxiety[6,10,12].

The total score for each scale ranges from 20 to 80, with higher scores indicating greater levels of anxiety. These scales do not have universally defined cutoff points for interpretation, as anxiety levels may vary based on individual and sample characteristics. In this study, we adopted this classification, as it was related to nursing care provided to patients in the preoperative period.

Data on age, sex, employment status, and educational level were collected alongside the administration of the STAI during bedside visits to preoperative inpatients in the surgical unit awaiting

various types of surgery. A nursing student previously trained in data collection conducted the interviews and completed the forms. The data were then organized, exported, and tabulated using licensed Microsoft Office Excel software. Subsequently, scores for positively worded items were reversed: STAI-State – items 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20; STAI-Trait – items 1, 6, 7, 10, 13, 16, and 19. The data were then transferred to the Statistical Package for the Social Sciences (SPSS), version 23, for statistical analysis.

Descriptive statistics, which include techniques for describing, summarizing, aggregating, and presenting research data, were applied using frequency distributions and measures of central tendency. Additionally, a t-test was conducted to compare state anxiety and trait anxiety scores by sex[13].

Ethical principles were upheld in accordance with Resolution 510/16 of the Brazilian National Health Council, which regulates research involving human subjects. The study was approved under CAAE: 26333019.5.0000.5324.

RESULTS

The final sample of the study consisted of 50 preoperative patients admitted to a surgical unit, aged between 14 and 82 years, with a mean age of 52.16 years and a standard deviation (SD) of 19.64 years. In terms of biological sex, the majority were women (64%; n = 32), while men accounted for 36% (n = 18) of the sample. Regarding marital status, 32% (n = 16) were married, 28% (n = 14) were single, and 16% (n = 8) were widowed.

Regarding educational level, 48% of the participants had not completed basic or middle school, 18% had completed middle school, 24% had completed or partially completed high school, and 10% had completed or partially completed higher education.

In terms of employment status, 42% of participants were retired, receiving a pension, or on sick leave; 26% were employed in the public or private sector; 16% were self-employed; 8% were unemployed; and the remaining 8% were students or homemakers.

According to the STAI-State cutoff points, eight patients were classified as having low levels of anxiety, 36 as having moderate levels, and six as having high levels of anxiety. For the STAI-Trait, five patients had low levels of anxiety, 35 had moderate levels, and ten had high levels of anxiety (Table 1).

Table 1 – Descriptive statistics of the STAI-state and STAI-trait scores. Rio Grande, RS, Brazil. 2023. n= 50

Cutoff points	n STAI-state	%	n STAI-trait	%
Low anxiety levels (20 to 30 points)	8	16	5	10
Moderate anxiety levels (31 to 49 points)	36	72	35	70
High anxiety levels (50 ≥ points)	6	12	10	20

Source: Study data.

The results concerning trait and state anxiety among preoperative patients, as measured by the STAI, showed a mean score of 38.14 for state anxiety, with a standard deviation of 7.97. The mean score for trait anxiety was 41.52, with a standard deviation of 9.62 (Table 2).

Table 2 – Descriptive statistics of the STAI-state and STAI-trait scores. Rio Grande, RS, Brazil. 2023. n= 50

STAI	n	Minimum	Maximum	Mean (SD)
State	50	25	53	38.14 (7.97)
Trait	50	26	69	41.52 (9.62)

Legend: SD = Standard Deviation

Source: Study Data.

Next, an independent samples t-test was conducted for state and trait anxiety, comparing female and male groups. The mean score for state anxiety among women was 40.03, and 42.28 for trait anxiety. Among men, the mean score was 34.78 for state anxiety and 40.17 for trait anxiety. A statistically significant difference was found in state anxiety between women and men (p = 0.024; p < 0.05), while no significant difference was observed for trait anxiety. Hence, these results indicate a significant difference in state anxiety scores between female and male participants (Table 3).

Table 3 – T-test results for state anxiety and trait anxiety according to sex. Rio Grande, RS, Brazil. 2023. n=50

Anxiety	Sex	n	Mean	*p-value*
State	Female	32	40.03	0.024
	Male	18	34.78	
Trait	Female	32	42.28	0.462
	Male	18	40.17	

Source: Study data.

DISCUSSION

The participants in this study had a mean age of 52.16 years, with a standard deviation (SD) of 19.64. A study investigating the immediate preoperative period in patients undergoing bariatric surgery via video laparoscopy, which also used the State-Trait Anxiety Inventory, reported a mean age of 42.21 years, with a SD of 10.06[14].

Some researchers have reported that age is not a determining factor in anxiety levels[15,16,17], while another study[18] found that anxiety was significantly higher among middle-aged patients. This was attributed to greater family responsibilities in this age group and the possibility that younger individuals are more informed about health-related issues through technology.

There was a predominance of female participants: of the 50 patients, 32 were women (64%) and 18 were men (36%). Additionally, the t-test revealed a statistically significant difference in mean state anxiety scores between women and men (p = 0.024; p < 0.05), consistent with findings reported in the literature[6,19].

However, another study conducted with 210 patients aged 18 to 65 years, using the STAI, reported a higher proportion of male participants, as the study was conducted in a hospital serving a military base. In this case, there was a predominance of men over women. Contrary to the general literature, that study found that anxiety levels were statistically higher among men than women in the preoperative period[1].

Although anxiety related to separation from family has been more frequently reported by women, some studies suggest that women tend to express their anxieties and emotions more readily than men. This difference may be related to the fact that men typically express their emotions to a

more limited extent. A combination of biological factors – such as the influence of female sex hormones – may help explain these differences, along with the burden of multiple roles that women often carry as a result of recent societal changes. These factors are more evident in contexts characterized by high emotional demands, overlapping responsibilities, and the work-family dynamic[20-22].

Most individuals in the study sample were married (32%), while 28% were single. Regarding educational level, 48% had incomplete basic or middle education. Although some studies have reported higher anxiety levels with increasing educational attainment[21], another study found that education level did not influence anxiety levels[1].

The scores found in this study on the state anxiety scale revealed that eight patients experienced low levels of anxiety, 36 had moderate levels, and six showed high levels of state anxiety. These results are relatively similar to those of a study in which preoperative patients presented the following anxiety levels as measured by the STAI-State: low level, 10% (n = 4); moderate level, 65% (n = 26); and high level, 22.5% (n = 9)[6].

Five patients presented low levels of anxiety, 35 moderate levels, and 10 high levels of anxiety on the trait anxiety scale. One study using the STAI-Trait inventory found that patients predominantly presented low-level anxiety (17.5%, n = 7), moderate-level anxiety (72.5%, n = 29), and high-level anxiety (10%, n = 4)[6]. These findings demonstrate equivalence between the samples in both studies, as the same instrument was used.

A study conducted with inpatients in the surgical unit of a university hospital in the interior of São Paulo, Brazil, who were awaiting surgical treatment for colorectal cancer[19], reported results equivalent to those found in the present study. In this study, the mean STAI-State score was 38.14, with a standard deviation (SD) of 7.97, and the mean STAI-Trait score was 41.52, with an SD of 9.62.

The STAI-trait scores were higher than the STAI-state scores, indicating that participants predominantly exhibited trait anxiety rather than state anxiety. This suggests that these preoperative patients already have an anxious profile, characterized by personality traits that make them more prone to experiencing anxiety. This result may be explained by the fact that the hospitalization process itself is a trigger for stress and anxiety, which is further intensified when hospitalization is for a surgical procedure, as anxiety is often the initial response when individuals are confronted with a problem[22].

Preoperative anxiety is associated with complications such as difficult venous access, the need for higher doses of anesthetic induction agents and analgesics, and an increased risk of postoperative complications. Elevated anxiety levels negatively affect physiological parameters and may compromise the postoperative period, potentially resulting in prolonged hospital stays. Therefore, reducing preoperative anxiety can enhance surgical outcomes, shorten hospital stays, and help prevent postoperative complications[14].

In this context, nursing interventions may be useful and effective in reducing anxiety levels. A study conducted with 88 individuals at the Cardiovascular Surgery Service of a Medical-Surgical Research Center in Cuba, using an anxiety assessment tool, demonstrated that anxiety can be positively influenced through more humane and personalized care, without the need for additional pharmacological interventions targeting the affective dimension[23]. Similar results have also been reported by other authors[24-25].

Quality nursing care, along with the support of the multidisciplinary team, plays a vital role in the hospital experience. Healthcare professionals must use their knowledge to provide comprehensive care that meets patients' basic human needs, preparing them both physically and emotionally for surgery. This includes offering guidance, promoting self-care, and recognizing the patient's vulnerabilities to complications that may heighten stress and, consequently, impact the recovery process[22].

The team providing such care seeks to minimize the emotional impact that waiting for surgery has on patients. Among the strategies used to reduce anxiety, offering information about the upcoming procedure and promoting a welcoming, supportive approach are particularly important[26].

The hospital environment and preoperative routines can feel unfamiliar and may trigger anxiety symptoms in patients. However, rather than simply assuming what patients need to know, it is essential for the healthcare team to understand each individual's specific needs and provide personalized care through a systematic approach. In addition, social and family support, as well as the patient's religious and spiritual resources, has been shown to help reduce tension during the preoperative period[26].

This study's limitations include the difficulty in reaching the intended sample size, as the pandemic led to a reduction in the number of elective surgeries and, consequently, fewer patients hospitalized for surgical procedures. As a result, the number of participants was lower than expected. Nevertheless, the findings remain relevant to nursing practice, as identifying patients with anxiety symptoms requires professionals to implement appropriate interventions, in collaboration with the multidisciplinary team, to help ensure a calmer perioperative period and support postoperative recovery.

These findings highlight the need to educate patients during the preoperative period about the surgical procedure and postoperative care, as well as to plan and implement strategies to help manage anxiety and promote self-care. It is worth noting that further research can enhance the understanding of anxiety symptoms and their management among preoperative patients, contributing to the development of care strategies that are both scientifically grounded and humanized, ultimately improving patient-centered care and outcomes.

CONCLUSION

This study revealed differences between the groups in terms of state and trait anxiety levels, offering valuable information to support care planning and guide the development of targeted interventions for inpatients awaiting surgery.

It is important to note that nursing care for perioperative patients should be grounded in a relationship of support, acceptance, and trust, aiming to provide quality care that promotes well-being, reduces anxiety, and minimizes surgical risks. Additionally, the use of anxiety assessment tools and a collaborative approach with the multidisciplinary hospital team are essential components of effective care.

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EVALUATION OF ANXIETY IN PREOPERATIVE PATIENTS:
STATE-TRAIT ANXIETY INVENTORY INSTRUMENT (STAI)

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