Effect of preoperative anxiety level on postoperative pain, analgesic consumption in patients undergoing laparoscopic sleeve gastrectomy: an observational cohort study

Yonca Ozvardar Pekcan , Bahattin Tuncalı , Varlık Erol

PII: S0104-0014(21)00395-X
DOI: https://doi.org/10.1016/j.bjane.2021.11.003
Reference: BJANE 744320

To appear in: *Brazilian Journal of Anesthesiology (English edition)*

Received date: 6 May 2021
Accepted date: 13 November 2021

Please cite this article as: Yonca Ozvardar Pekcan , Bahattin Tuncalı , Varlık Erol , Effect of preoperative anxiety level on postoperative pain, analgesic consumption in patients undergoing laparoscopic sleeve gastrectomy: an observational cohort study, *Brazilian Journal of Anesthesiology (English edition)* (2021), doi: https://doi.org/10.1016/j.bjane.2021.11.003

BJAN-D-21-00194 - Original Investigation

Short title: Preoperative anxiety, postoperative pain: *an observational cohort study*

Effect of preoperative anxiety level on postoperative pain, analgesic consumption in patients undergoing laparoscopic sleeve gastrectomy: an observational cohort study

Yonca Ozvardar Pekcan[a,*], Bahattin Tuncalı[a], Varlık Erol[b]

[a]Başkent University School of Medicine, Department of Anesthesiology and Reanimation, Ankara, Turkey

[b]Medicana Hospital Izmir, Department of General Surgery, Izmir, Turkey

*** Corresponding author.** E-mail: yncapek@gmail.com (Y.O. Pekcan).

ORCID ID

Yonca Ozvardar Pekcan - 0000-0002-0991-7435

Bahattin Tuncali - 0000-0002-7898-2943

Varlık Erol - 0000-0002-7337-4973

Abstract

Backgraund: This prospective observational cohort study aimed to investigate the relationship between preoperative anxiety levels and postoperative pain and analgesic requirement in patients undergoing laparoscopic sleeve gastrectomy.

Methods: Forty two female patients with body mass index ≥ 35, who underwent laparoscopic sleeve gastrectomy for treatment of obesity were included in the study. Spielberger's state and trait anxiety scales were used in this study. Demographic data of the patients, anesthetic and analgesic drugs during the surgery, pain levels measured with verbal analog scale at the postoperative 1st, 4th, 12th, and 24th hour, sedation levels measured with the Ramsay sedation scale, and the amount of analgesic consumed were recorded. Anesthesiologist, surgeon, and patient were not informed of the anxiety level results. The relationship between preoperative anxiety and postoperative pain and

analgesic consumption was evaluated by Spearman's correlation analysis. Stepwise multiple linear regression analysis was applied. Normal Distribution control was performed by applying the Shapiro-Wilk test to residual values obtained from the final model.

Results: There was no relationship between trait anxiety level and postoperative pain and analgesic consumption. A correlation was found between state anxiety level and pain level up to 24 hours and analgesic consumption ($p < 0.05$). According to the obtained model it had been observed that the university graduates consumed more analgesic compared to other education level groups.

Conclusion: In this study, a relationship was found between preoperative state anxiety level and 24-hour pain scores and analgesic consumption in patients who underwent laparoscopic sleeve gastrectomy under general anesthesia.

KEYWORDS: Laparoscopy, Pain management, Postoperative pain, Preoperative anxiety

Introduction

Preoperative anxiety is a psychological problem that exists in patients before surgery. It, is used to express anxiety associated with the planned surgery and/or after the surgery, and its incidence is reported to be approximately 11–80%.[1,2] Similarly, there are studies reporting that concomitant psychiatric problems, such as anxiety disorder, may be as high as 48% in patients undergoing bariatric surgery.[3,4]

Studies examining the relationship between preoperative anxiety level and postoperative pain report conflicting results. Various studies have reported that high preoperative anxiety levels increase postoperative pain and analgesic consumption in patients undergoing operations, such as orthopedic surgery, laparoscopic cholecystectomy, abdominal hysterectomy, and breast surgery.[5-16] On the other hand, there are studies showing that there is no relationship between preoperative anxiety level and postoperative pain.[17-21] During our literature review, we did not find any study examining the relationship between preoperative anxiety levels and postoperative pain in patients undergoing laparoscopic bariatric surgery. The relationship between anxiety and postoperative pain and analgesic consumption could be revealed more clearly in this patient group with a detailed preoperative psychological assessment and low postoperative pain expectation compared to open surgery.

The aim of this study was to investigate the relationship between preoperative anxiety levels and postoperative pain and analgesic requirement in patients undergoing laparoscopic sleeve gastrectomy.

Methods

This study was carried out in accordance with the Declaration of Helsinki. After obtaining permission from the Clinical Research Ethics Committee (approval n^{o} KA17 / 24, Turkey, 12.04.2017), this study was conducted with 42 female patients aged between 18 and 65 years, who underwent laparoscopic sleeve gastrectomy, with an American Society of Anesthesiologists (ASA) physiological score ≤III, body mass index (BMI) ≥35, as a prospective, double-blind, and single-center observational cohort study, and was also registered in the Clinicaltrials.gov clinical trials registry (n^{o} NCT04432558). Written informed consent was obtained from all patients. The STROBE (Strengthening of Reporting of Observational Studies in Epidemiology) guidelines were followed when reporting this study. As preoperative anxiety levels of female patients were found to be higher compared to male patients in various studies, we preferred to conduct the study in female patients in order to eliminate the difference arising from gender.[22,23] Patients with any psychiatric or neurological disease, those who used psychiatric drugs (antidepressants, anxiolytics), chronic alcohol users, those who were allergic to the drugs used in the study, and illiterate patients were excluded from the study.

The state (STAI-I) and trait (STAI-II) anxiety scales, which were developed by Spielberger et al. in 1970, were used to measure preoperative anxiety. This scale is a 4-point Likert self-report scale consisting in a total of 40 items, 20 of which allocated in the state (STAI-I) and 20 in the trait (STAI-II) anxiety subscales. In particular, STAI-I measures the current state of anxiety and the STAI-II, the general state of anxiety. All items are followed by a 4-point scale rating the frequency of feelings from “not at all” to “very much” and scoring from 1 to 4. The score ranged from 20 to 80 points, and higher scores indicated higher levels of anxiety.[24] The questionnaire form was given to the patients in a closed envelope by the anesthesiologist on the date of their preoperative examination, and they were asked to open the envelope and answer the questions one day before the operation between 9.00 and 10.00 ppm. When the patient was discharged, the envelope was delivered to the anesthesiologist. The total scores were calculated with the manual scoring system and recorded on the form. If a

patient did not respond to more than three statements, the filled-out form was planned to be considered invalid. The anesthesiologist, surgeon and patient all were unaware of the preoperative anxiety score before the discharge of the patient.

Demographic data including age, height, body weight, body mass index (BMI), ASA score, and schooling (Primary School = Low, Secondary-High School = Middle, University = High) of the patients who were taken to the operating room were recorded. Following standard monitoring, which included electrocardiography (ECG), non-invasive blood pressure, body temperature, and peripheral oxygen saturation (SpO2), standard anesthesia protocol was applied to all patients. After anesthesia induction with intravenous (IV) 0.02 $mg.kg^{-1}$ midazolam, 1 $\mu gr.kg^{-1}$ fentanyl, 2 $mg.kg^{-1}$ propofol, endotracheal intubation was provided with 1 $mg.kg^{-1}$ rocuronium. A 2–3% concentration of sevoflurane in oxygen and nitrous oxide (50–50%) was used for maintenance of anesthesia. After the operation started, 10 $mg.kg^{-1}$ paracetamol was administered via intravenous infusion for 15 minutes for analgesia and 1 $mg.kg^{-1}$ tramadol HCL was administered via intravenous bolus at the end of the operation. For postoperative nausea/vomiting prophylaxis, 10 mg metoclopramide and 8 mg ondansetron were administered via IV injection. Ideal body weight was taken into consideration while adjusting drug doses. The number of analgesic drugs used during the operation and the duration of the operation were recorded.

During the preoperative evaluation, the patients were informed about patient-controlled analgesia (PCA). For postoperative analgesia, tramadol HCL was prepared as 2 $mg.mL^{-1}$ in 100 mL isotonic saline solution. After the patient was awakened, PCA was initiated with 10 $mg.h^{-1}$ infusion, 20 mg bolus, 15-minute lockout interval, and a 4-hour limit of 200 mg while leaving the operating room according to the modified Aldrete criteria.[25] In the postoperative period, patients were followed up in the post-anesthesia care unit and were transported to the service within 1–3 hours. The verbal analog scale (VAS, 0 = no pain, and 10 = unbearable pain) was used to evaluate the pain level at the 1^{st}, 4^{th}, 12^{th}, and 24^{th} postoperative hours, and the Ramsay sedation scale was used to evaluate the sedation level.[26] If the VAS pain score was > 4, and 4 hours had passed from the first paracetamol dose, 10 $mg.kg^{-1}$ paracetamol IV infusion was administered, if 4 hours had not passed, diclofenac sodium 1–3 $mg.kg^{-1}$ intramuscular (IM) was administered and the VAS score was reevaluated after 1 hour. The maximum daily dose of diclofenac sodium was administered not exceeding 150 mg and the

paracetamol dose not exceeding 4 g. The amount of analgesic administered for 24 hours in the postoperative period was recorded.

During or after surgery, if the heart rate was < 50, IV atropine (10 µgr.kg^{-1}) was administered, if the heart rate was ≥ 100 beats.minute^{-1} or if the blood pressure was 20% above the basal blood pressure value, fentanyl (50 µgr IV) was administered, if the Ramsay score exceeded 4 in the postoperative period, the tramadol HCL infusion rate was reduced by half and reevaluation was planned after 30 minutes.

Statistical analysis

Statistical analysis of the data obtained in the study was carried out with the IBM SPSS Statistics for Windows, Version 25.0 (Released 2017, Armonk, NY: IBM Corp.) package program. A power analysis based on correlation analysis was used to determine the linear relationship between postoperative pain and analgesia consumption and anxiety level. Stepwise multiple linear regression analysis was applied, and normal distribution control was performed by applying Shapiro-Wilk test to residual values obtained from the final model.

At least 37 volunteers were calculated as being sufficient to find a significant linear relationship between the two variables at a large class effect size (r = 0.50) by using two-way hypothesis testing with 90% power at the 0.05 Type-I error level.

Results

A total of 42 female patients were included in the study. Demographic data including age, height, body weight, BMI, and schooling (Primary School = Low, Secondary-High School = Middle, University = High) are summarized in Table 1. No statistically significant difference was found between demographic data and anxiety scores (STAI-I, II) in the analysis performed with Spearman's correlation analysis.

A correlation was found between the state anxiety level and VAS values at the 24th hour, and the total tramadol dose at the 24th hour (Table 2, Figs. 1 and 2). However, no relationship was found between the trait anxiety level and VAS values and analgesic consumption (Table 2).

Age, BMI, operation time, STAI-I, STAI-II variables were used numerically in their original scales.

Schooling was taken as a 2-class categorical variable and coded as 0 (1+2) – 1 (3).

Using these variables, in the Multiple Stepwise Linear Regression analysis applied for the Total Tramadol (mg) variable, firstly the Age variable was entered into the model ($p = 0.009$), and then the model was completed with STAI-I ($p = 0.013$).

According to the obtained model, a 1-year increase in the age variable caused a decrease of 2.973 mg in analgesic consumption, while a 1-unit increase in the STAI-I level resulted in a 2.464 mg increase in analgesic consumption (Table 3).

In the analysis for pain scores (VAS Total), only education level was included in the model ($p = 0.034$).

According to the obtained model it had been observed that the university graduates consumed an average of 3.677 mg more analgesic compared to other schooling groups (Table 4).

Discussion

With this prospective observational cohort study, a correlation was found between the preoperative STAI-I level measured the night before the operation and the pain level at the postoperative 24th hour and analgesic consumption in patients who underwent laparoscopic sleeve gastrectomy for obesity.

Every patient who is scheduled for surgery experiences anxiety as a physiological and psychological response. The level of anxiety can vary depending on various factors. Although the results of the studies are contradictory, it has been stated that age, gender, characteristics of surgery, ASA, past operational experience, education level, personality, marital status, occupation, health insurance, approach to the disease, cultural and religious beliefs are factors affecting the preoperative anxiety level.[8,9,11,17,20,26] In our study, a decrease was observed in analgesic consumption with increasing age. This decrease due to the increase in age was attributed to the fatalistic perspective that develops in advanced ages due to cultural and religious beliefs in our society, and patients' reluctance to ask for analgesics because of their comorbidities due to the fear of drug side effects. In addition, in our study, university graduates were observed to consume more analgesics than other level of education groups. In another study; the identifiers of patient satisfaction in pain management after day surgery were investigated, and they were stated as low preoperative pain, no preoperative analgesic consumption, high expected post-operative pain, and low education level.[27]

It has been stated that preoperative anxiety facilitates the activation of the entorhinal cortex of the hippocampal formation and causes the pain threshold to be lowered and the pain intensity to be perceived as more than it actually is. By showing that there is a positive relationship between postoperative pain and anxiety, it has been reported that increased anxiety and fear cause an increase in pain severity and the need for opioids after surgery, and that patients try to overcome anxiety and tension in this way.[15,16]

High levels of pain and anxiety, especially in obese patients, can stimulate the neuroendocrine system and cause cardiac complications, respiratory system problems, increase in gastrointestinal symptoms such as nausea and vomiting, and increase in postoperative mortality and morbidity due to the immune system being affected.[28-31]

Bayrak et al.[16] reported that patients who had laparoscopic cholecystectomy with high anxiety scores measured by the Spielberger anxiety scale had dissatisfaction with intraoperative unstable hemodynamic parameters (arterial pressure, heart rate, peripheral oxygen saturation), increased postoperative pain, and analgesic consumption. In another study, patients with preoperative state anxiety score above 45 and who had cesarean section with general anesthesia had higher pain levels in the first 12 hours, but no correlation was found with analgesic consumption.[7] In a study conducted by Kain et al[8] on patients who underwent abdominal hysterectomy, they stated that state anxiety was associated with the patient's sudden postoperative pain, and it was even a positive predictor of postoperative pain. In their study, in which they compared preoperative benzodiazepine with placebo and evaluated cortisol, interleukin 6, T and B lymphocyte values, they stated that the consumption of painkillers decreased within the first four hours after the operation and did not change in total, and they attributed this to the increased pain in abdominal surgeries.[20] Yılmaz et al.[21] could not find a relationship between preoperative and postoperative anxiety levels and postoperative pain levels and analgesic need in their study on septoplasty operations, and they attributed this to low pain due to the minor surgery. Possible reasons for the contradictory results in various studies may be the type of surgery performed, duration of surgery, type of anesthesia, patient groups, and the postoperative analgesia protocol applied. Since this study was a laparoscopic surgery, VAS values may have been found to be low in the first 24 hours. Patients' attitudes toward drugs may also be effective in consumption of analgesics. Although some patients experience pain due to side effects or fear of addiction, some patients may overuse analgesics because they fear pain or

restlessness.[11] Such situations may make it difficult to determine the relationship between anxiety, pain, and analgesic consumption. In a study conducted on 1.416 non-cardiac and non-brain surgery patients, the anxiety level measured by the Amsterdam Preoperative Anxiety and Information Scale, not the anxiety level measured by STAI, was found to be more sensitive in predicting postoperative pain; however, it was stated that female gender, young age, preoperative pain score, type of surgery and size of incision are independent predictors of severe postoperative pain.[17] In addition, another study stated that measurements with STAI-I and II were based on subjective anxiety and pain complaints rather than physical indicators, and the evaluation of preoperative pain was recommended for future studies.[15,19] In a study comparing the scales, it was stated that high values measured by the Pain Catastrophizing Scale (PCS) may be an indicator of higher postoperative pain scores without increasing opioid use.[6]

This study has several limitations. First, the fact that the preoperative pain, postoperative anxiety score and PCS score were not assessed and this may have caused self-reporting bias (when the patient ranks his anxiety higher than the average person with the same amount of anxiety). The lack of correlation between trait anxiety and pain may be explained by the fact that the available evidence is not strong enough to exclude a consistent self-report bias of patient responses to the criteria used in the study, rather than a causal relationship. The subjective nature of the measurements may have caused a lack of power. Second, preoperative anxiety and postoperative pain assessments were based on self-reporting and not on clinical diagnoses. Objective evaluations could be achieved in patients with measurement of cortisol and noradrenaline in saliva and blood, changes in blood pressure and heart rate, grimace and muscle tone. The third limitation was that patients completed the tests on their own. This problem can be overcome by filling it in by an anesthesia or psychiatrist 1 day before surgery. Thus, newly developed depression can also be diagnosed. Finally, the small number of patients is also a limiting factor in this study.

Conclusion

In this study, no correlation was found between the preoperative trait anxiety score level and postoperative pain and analgesic consumption in patients who underwent laparoscopic sleeve gastrectomy under general anesthesia. However, a significant relationship was found between the state anxiety level and 24-hour analgesic consumption. We conclude that these results may contribute to postoperative pain management in patients undergoing laparoscopic sleeve gastrectomy.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Jawaid M, Mushtaq A, Mukhtar S, et al. Preoperative anxiety before elective surgery. Neurosciences (Riyadh). 2007;12:145-48.

2. Akinsulore A, Owojuyigbe A, Faponle A, et al. Assessment of preoperative and postoperative anxiety among elective major surgery patients in a tertiary hospital in Nigeria. Middle East J Anaesthesiol. 2015;23:235-40.

3. de Zwaan M, Enderle J, Wagner S, et al. Anxiety and depression in bariatric surgery patients: A prospective, follow-up study using structured clinical interviews. J Affect Disord. 2011;133:61-8.

4. Edwards-Hampton SA, Madan A, Wedin S, et al. A closer look at the nature of anxiety in weight loss surgery candidates. Int J Psychiatry Med. 2014;47:105-13.

5. De Cosmo G, Congedo E, Lai C, et al. Preoperative psychologic and demographic predictors of pain perception and tramadol consumption using intravenous patient-controlled analgesia. Clin J Pain. 2008;24:399-405.

6. Dunn LK, Durieux ME, Fernández LG, et al. Influence of catastrophizing anxiety,and depression on in-hospital opiod consumption, pain, and quality of recovery after adult spine surgery. J Neurosurg Spine. 2018;28:119-26.

7. Ozturk Inal Z, Gorkem U, Inal HA. Effects of preoperative anxiety on postcesarean delivery pain and analgesic consumption: general versus spinal anesthesia. J Matern Fetal Neonatal Med. 2020;33:191-7.

8. Kain ZN, Sevarino F, Alexander GM, et al. Preoperative anxiety and postoperative pain in women undergoing hysterectomy. A repeated-measures design. J Psychosom Res. 2000;49:417-22.

9. Kain ZN, Sevarino F, Pincus S, et al. Attenuation of the preoperative stress response with midazolam: effects on postoperative outcomes. Anesthesiology. 2000;93:141-7.

10. Polomano RC, Heffner SM, Reck DL, et al. Evidence for opioid variability, Part 2: Psychosocial influences. Semin Perioper Nurs. 2001;10:159-66.

11. Caumo W, Hidalgo MPL, Schmidt AP, et al. Effect of pre-operative anxiolysis on postoperative pain response in patients undergoing total abdominal hysterectomy. Anaesthesia. 2002;57:740-46.

12. Ozalp G, Sarioğlu R, Tuncel G, et al. Preoperative emotional states in patients with breast canserand posoperative pain. Acta Anaesthesiol Scand. 2003;47:26-9.

13. Feeney SL. The relationship between pain and negative affect in older adults: anxiety as a predictor of pain. J Anxiety Disord. 2004;18:733-44.

14. Granot M, Ferber SG. The roles of pain catastrophizing and anxiety in the prediction of postoperative pain intensity: a prospective study. Clin J Pain. 2005;21:439-45.

15. Ip HYV, Abrishami A, Peng PWH, et al. Predictors of postoperative pain and analgesic consumption: a qualitative systematic review. Anesthesiology. 2009;111:657-77.

16. Bayrak A, Sagiroğlu G, Copuroglu E. Effects of preoperative anxiety on intraoperative hemodynamics and postoperative pain. J Coll Physicians Surg Pak. 2019;29:868-73.

17. Kalkman JC, Visser K, Moen J, et al. Preoperative prediction of severe postoperative pain. Pain. 2003;105:415-23.

18. Hashimoto K, Iwayama S, Sano Y, et al. Preoperative anxiety induces no clinically relevant effect on intraoperative nociceptive levels during breast surgery under general anesthesia. J Anesth. 2015;29:967-70.

19. Munafo MR, Stevenson J. Selective processing of threat-related cues in day surgery patients and prediction of post-operative pain. Br J Health Psychol. 2003;8:439-49.

20. Kain ZN, Sevarino FB, Rinder C, et al. Preoperative anxiolysis and postoperative recovery in women undergoing abdominal hysterectomy. Anesthesiology. 2001;94:415-22.

21. Yılmaz Y, Durmus K, Inal FY, et al. The effect of preoperative and postoperative anxiety on postoperative pain and analgesic need in septoplasty operations. Dicle Med J. 2014;41:288-29.

22. Papageorgiou GM, Papakonstantinou A, Mamplekou E, et al. Pre- and postoperative psychological characteristicsin morbidly obese patients. Obes Surg. 2002;12:534-9.

23. Kim WS, Byeon GJ, Song BJ, et al. Availability of preoperative anxiety scale as a predictive factor for hemodynamic changes during induction of anesthesia. Korean J Anesthesiol. 2010;58:328-33.

24. Oner N, Le Compte A. State-Trait Anxiety Inventory Handbook, 1. Print, Istanbul: Bogazici University Publications. 1983:1-26.

25. Aldrete JA. The post-anesthesia recovery score revisited. J Clin Anesth. 1995;7:89-91.

26. Ramsay MA, Savege TM, Simpson BR, et al. Controlled sedation with alphaxalone-alphadolone. Br Med J. 1974;2:656-59.

27. Coluzzi F, Bragazzi L, Di Bussolo E, et al. Determinants of patient satisfaction in postoperative pain management following hand ambulatory day-surgery. Minerva Med. 2011;102:177-86.

28. Karaman S, Dogru S, Karaman T, et al. Anesthesia management in laparoscopic bariatric surgery: Perioperative complications and outcomes in the third year of practice. JCEI. 2014;5:200-5.

29. Vaughn F, Wichowski H, Bosworth G. Does preoperative anxiety level predict postoperative pain? AORN J. 2007;85:589-604.

30. Rodrigues HF, Furuya RK, Dantas RAS, et al. Association of preoperative anxiety and depression symptoms with postoperative complications of cardiac surgeries. Rev Lat Am Enfermagem. 2018;26:3107.

31. Casati A, Putzu M. Anesthesia in the obese patient: pharmacokinetic considerations J Clin Anesth. 2005;17:134-45.

Table 1 - Demographic characteristics of the participants.

Variables	**n**	**%**
Age		
18–35	22	52.3
36–50	14	33.3
51–65	6	14.2
Schooling		
Low (Primary school)	11	26.1
Middle (Middle and high school)	15	35.7
High (University)	16	38.0
BMI		
35–42	20	47.6
43–50	17	40.4
51–58	4	9.5
59–65	1	2.3
Time		
0–120 minutes	27	64.2
121–240 minutes	14	33.3
241–360 minutes	1	2.3

BMI, Body mass index ($kg.m^{-2}$).

Table 2 - Relationship between state and trait anxiety scores with VAS and analgesic consumption.

	VAS 24.h	**Tramadol (consumed 24h with PCA)**	**Total Tramadol (PCA + IV consumed 24h)**
STAI-I	r = 0.378	r = 0.416	r = 0.436
	p = 0.014	*p* = 0.006	*p* = 0.004
STAI-II	r = 0.169	r = 0.160	r = 0.165
	p = 0.284	*p* = 0.160	*p* = 0.297

r, Spearman's correlation coefficient; VAS, visual analog scale; STAI-I, state anxiety score; STAI-II, trait anxiety score.

Table 3 - Relationship between state anxiety scores and age with analgesic consumption (total tramadol).

	B	**Std. Error**	***p***
(Constant)	381.272	57.546	< 0.001
AGE	-2.973	1.077	0.009
STAI-I	2.464	0.941	0.013

(R^2 = 28.8%, p = 0.001)

STAI-I, State anxiety score; R^2, Multiple Stepwise Linear Regression's determination coefficient.

Table 4 - Relationship between VAS and schooling.

	B	**Std. Error**	***p***
(Constant)	13.105	1.238	< 0.001
Schooling	3.677	1.674	0.034

(R^2 = 10.8%, p = 0.034)

R^2, Multiple Stepwise Linear Regression's determination coefficient; VAS, visual analog scale.

Figure 1 - Visual analog scale values at the 24th hour with STAI-I. STAI-I, state anxiety score; VAS, visual analog scale.

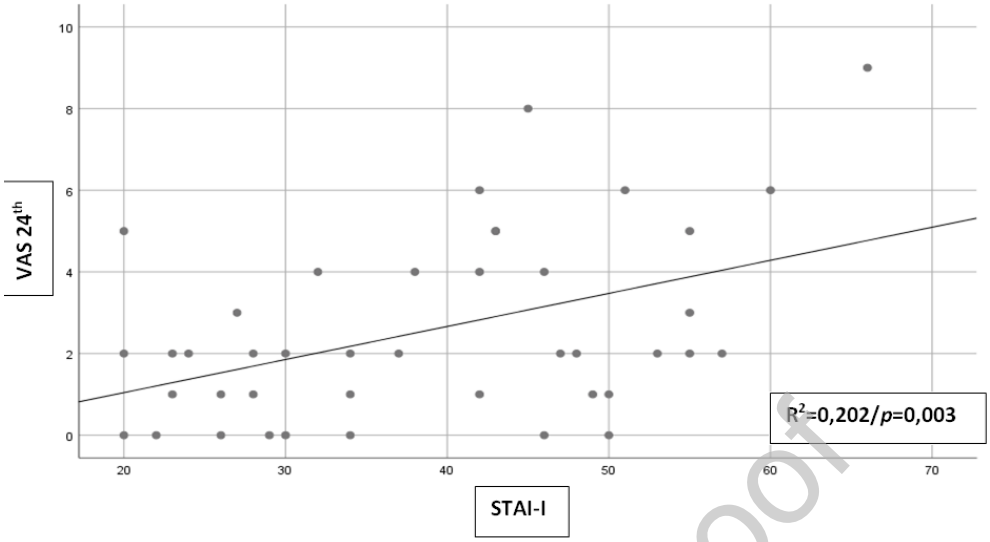

Figure 2 - Total dose of tramadol consumed at the 24th hour with STAI-I. STAI-I, state anxiety score.