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# Awareness, Acceptance, and Associated Factors of Peripheral Nerve Blocks in Patients Undergoing Elective Surgery: A Cross-Sectional Survey

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## Abstract

# Objective

Although peripheral nerve blocks (PNBs) have become an integral part of modern anesthetic practice with the widespread use of ultrasound guidance, patient awareness remains limited. This study aimed to evaluate patients' awareness of PNBs, their acceptance of this anesthetic technique, the relationship between preoperative anxiety and PNB acceptance, and the factors associated with PNB acceptance among patients attending a preoperative anesthesia clinic.

# Materials and Methods

Following ethics committee approval, this cross-sectional survey included 303 adult patients (18–80 years) scheduled for elective surgery suitable for a peripheral nerve block who attended the preoperative anesthesia clinic between April and June 2024. A structured two-part questionnaire was administered. The first section collected sociodemographic and clinical characteristics, whereas the second assessed awareness, preferences, and concerns regarding anesthetic techniques and PNBs. Data were analyzed using the chi-square test, Fisher's exact test, and Mann–Whitney U test. Independent factors associated with PNB acceptance and preoperative anxiety were identified using multivariable logistic regression analysis.

# Results

The median age was 39 years (interquartile range [IQR], 27–56), and 55.4% of participants were female. General anesthesia was the best-known anesthetic technique (71.9%), whereas 23.1% of patients were unaware of any anesthetic method. Awareness of at least one anesthetic technique increased significantly with educational level ($p = 0.002$). Only 11.2% of patients were familiar with PNBs for postoperative pain management; however, 55.8% reported willingness to accept PNB after receiving information, and 81.5% indicated that the anesthesiologist's recommendation strongly influenced their decision. Multivariable logistic regression identified preoperative anxiety as the only independent factor associated with lower PNB acceptance (adjusted OR = 0.51, 95% CI: 0.31–0.84; $p = 0.007$), while the presence of comorbidities independently predicted preoperative anxiety (adjusted OR = 2.35, 95% CI: 1.23–4.49; $p = 0.010$).

# Conclusion

Awareness of PNBs among patients undergoing elective surgery was low; nevertheless, more than half were willing to accept the technique after receiving appropriate information. Preoperative anxiety was independently associated with lower PNB acceptance, whereas comorbidities independently predicted

preoperative anxiety. Structured preoperative counseling and anxiety-reduction strategies may facilitate informed decision-making and improve patient acceptance of PNBs.

# INTRODUCTION

Preoperative anxiety of varying degrees is observed in 60–80% of patients scheduled for surgery, and this condition is associated with increased perioperative hemodynamic responses, elevated anesthetic and analgesic requirements, and adversely affected postoperative recovery (1, 2). Important sources of anxiety include concerns that are widespread in society regarding the anesthetic technique to be administered, such as fear of death, fear of disability, and fear of not waking up from anesthesia (1, 3). Providing patients with detailed information about the procedures to be performed during the preoperative assessment and obtaining written informed consent is not only a legal requirement but also an important element in alleviating the concerns of patients and their relatives and in strengthening the physician–patient relationship (3, 4).

Peripheral nerve blocks (PNBs) have gained an increasingly important place in regional anesthesia practice in recent years. PNBs offer numerous advantages, including the provision of adequate surgical anesthesia, effective postoperative analgesia, facilitation of early mobilisation and early discharge, and the opportunity to avoid the complications of general anesthesia and central neuraxial blocks (5–9). With the widespread clinical use of ultrasonography, PNB applications have become safer and more commonly preferred today (4, 5). Nevertheless, PNBs are still used relatively infrequently in ambulatory and elective surgical practice compared with other anesthetic techniques (10); among the reasons cited for this are not only practitioner experience but also prejudices and misconceptions about regional anesthesia prevalent in society (5, 11, 12).

Studies examining patients' levels of knowledge about anesthesia practices have shown that knowledge about anesthesia and anesthesiologists is insufficient in both developed and developing countries (13–18). However, studies in the literature evaluating knowledge specific to PNBs — a newer and less well-known technique compared with general anesthesia and central blocks — are limited. Moreover, in Turkey, the number of comprehensive studies jointly evaluating patients' preoperative knowledge of PNBs, their acceptance of the technique, its relationship with preoperative anxiety, and the factors associated with this acceptance is quite limited. To address this knowledge gap, this study aimed to evaluate the knowledge levels of patients presenting to the anesthesiology and reanimation outpatient clinic for preoperative assessment regarding PNBs, to determine the rate of PNB preference and the reasons for non-preference, and to raise awareness of PNBs among patients.

# MATERIALS AND METHODS

This cross-sectional survey study was conducted at the Anesthesiology and Reanimation Outpatient Clinic of Giresun Training and Research Hospital, in accordance with the principles of the Declaration of Helsinki, after obtaining approval from the Scientific Research Ethics Committee of Giresun Training and

Research Hospital (date: 03.04.2024, number: 02) and institutional permission. Patients aged 18–80 years who presented to the outpatient clinic for preoperative assessment between April 2024 and June 2024, who were scheduled for elective surgery amenable to peripheral block, and who agreed to participate in the study were included. Written informed consent was obtained from all participants.

Patients younger than 18 or older than 80 years, patients with mental retardation or with whom communication could not be established, and patients with contraindications to the anesthetic technique to be administered (e.g., severe chronic obstructive pulmonary disease for general anesthesia, infection at the application site for peripheral block, etc.) were excluded from the study. No a priori power analysis was performed for sample size; all patients meeting the inclusion criteria during the study period were enrolled consecutively. In this manner, 303 patients who met the inclusion criteria and completed the questionnaire during the study period were included in the analysis.

Data were collected via face-to-face interviews accompanied by an interviewer, using a two-part questionnaire developed by the researchers in line with the literature. The questionnaire items were developed after reviewing previously published questionnaires assessing patients' knowledge of anesthesia, regional anesthesia, and preoperative anxiety, and were adapted to address issues specific to PNBs. The first part inquired about sociodemographic and clinical characteristics such as age, sex, marital status, having children, educational status, occupation, ASA (American Society of Anesthesiologists) physical status class, comorbidities, type of planned surgery, surgical history, anesthesia history, and peripheral block history. The second part comprised 14 questions evaluating known anesthetic techniques, sources of information, preferred anesthetic technique, factors influencing preference, concerns about anesthesia and their reasons, satisfaction with previous general and regional anesthesia experiences, the impact of being awake during surgery, awareness of PNB techniques for postoperative pain management, acceptance of PNB administration, and concerns regarding PNBs. Multiple options could be selected for applicable questions.

# Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics 20.0 (IBM SPSS, Turkey) under the consultancy of a statistician. The conformity of variables to normal distribution was assessed with the Shapiro–Wilk test. Descriptive statistics were presented as median (interquartile range) for continuous variables and frequency (percentage) for categorical variables. Since the age variable did not show normal distribution on the Shapiro–Wilk test, the Mann–Whitney U test was used for between-group comparisons of continuous variables. For comparisons of categorical data, the chi-square test was applied, along with the Yates continuity-corrected chi-square test for 2×2 tables and Fisher's exact test when the expected cell count was less than 5. Variables found to be associated with PNB acceptance and preoperative anxiety in univariate analyses, together with those considered clinically relevant, were entered into multivariate logistic regression models constructed separately for these two outcome variables. The models included age (per 10-year increase), sex (reference: male), educational status (reference: no formal education), comorbidity, anesthesia history, and awareness of PNBs as

independent variables; the anxiety variable was additionally added to the PNB acceptance model. Results were presented as adjusted odds ratios (OR) with 95% confidence intervals (CI); model fit was assessed with the Hosmer–Lemeshow test, and discrimination with the area under the ROC curve (AUC). The significance level was set at $p < 0.05$.

This study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement for observational studies.

# RESULTS

During the study period, 321 patients were assessed for eligibility. Of these, 18 patients were excluded because they did not meet the inclusion criteria or declined to participate. Finally, 303 patients completed the questionnaire and were included in the final analysis (Fig. 1). The median age of the 303 patients included in the study was 39 years (interquartile range [IQR] 27–56); 168 (55.4%) were female and 135 (44.6%) were male. Of the patients, 64.0% were married, 31.7% were university graduates, and 67.0% were classified as ASA I. A surgical history was present in 55.8% of the patients; the proportion of patients who had previously undergone a peripheral block was only 2.0%. The sociodemographic and clinical characteristics of the participants are presented in Table 1.

Table 1
Sociodemographic and clinical characteristics of the patients (n = 303)

| **Characteristic** | | **n (%)** |
|---|---|---|
| Age (years), median (IQR) | | 39 (27–56) |
| Sex | Female | 168 (55.4) |
| | Male | 135 (44.6) |
| Marital status | Married | 194 (64.0) |
| | Single | 109 (36.0) |
| Children | Yes | 191 (63.0) |
| | No | 112 (37.0) |
| Educational status | No formal education | 20 (6.6) |
| | Primary education | 113 (37.3) |
| | High school | 74 (24.4) |
| | University | 96 (31.7) |
| Occupation | Housewife | 93 (30.7) |
| | Self-employed | 72 (23.8) |
| | Civil servant | 49 (16.2) |
| | Student | 34 (11.2) |
| | Worker | 30 (9.9) |
| | Retired | 25 (8.3) |
| ASA class | I | 203 (67.0) |
| | II | 88 (29.0) |
| | III | 12 (4.0) |
| Comorbidity | Yes | 101 (33.3) |
| Surgical history | Yes | 169 (55.8) |
| Anesthesia history* | None | 134 (44.2) |
| | General anesthesia | 160 (52.8) |
| | Regional anesthesia | 21 (6.9) |
| | Sedoanalgesia | 3 (1.0) |

| Characteristic | | n (%) |
|---|---|---|
| Peripheral block history | Yes | 6 (2.0) |

ASA: American Society of Anesthesiologists. IQR: interquartile range. *The total exceeds 100% as multiple options could be selected.

The patients' level of knowledge about anesthetic techniques, their sources of information, and their preferences are shown in Table 2. The most commonly known technique was general anesthesia (71.9%), followed by local anesthesia (53.5%) and regional anesthesia (35.6%); 23.1% of the patients stated that they did not know any anesthetic technique. A significant association was found between educational level and not knowing any technique; the proportion of those who knew no technique was 50.0% among those with no formal education, 24.8% among primary school graduates, 27.0% among high school graduates, and 12.5% among university graduates ($p = 0.002$). The most frequent sources of information were a relative who had undergone surgery (44.9%) and the patient's own surgical experience (41.9%). When asked about their preferred anesthetic technique, 85.1% of the patients reported that they could prefer general anesthesia, 19.5% regional anesthesia, and only 6.6% a peripheral block. Of the patients, 49.2% stated that what they had heard from those around them influenced their choice of technique, while 81.5% stated that the anesthesiologist's recommendation influenced their preference.

Table 2
Knowledge of anesthetic techniques, sources of information, and preferences (n = 303)

| Question / Response | n (%) |
|---|---|
| **Known anesthetic techniques*** | |
| General anesthesia | 218 (71.9) |
| Local anesthesia | 162 (53.5) |
| Regional anesthesia | 108 (35.6) |
| I know none of them | 70 (23.1) |
| **Source of information*** | |
| From a relative who had surgery | 136 (44.9) |
| I had undergone surgery myself | 127 (41.9) |
| Internet | 75 (24.8) |
| Television / Newspaper | 46 (15.2) |
| **Preferred anesthetic technique*** | |
| General anesthesia | 258 (85.1) |
| Regional anesthesia | 59 (19.5) |
| Peripheral block | 20 (6.6) |
| **Does hearsay from those around you influence your preference? (Yes)** | 149 (49.2) |
| **Does the anesthesiologist's recommendation influence your preference? (Yes)** | 247 (81.5) |

*The total exceeds 100% as multiple options could be selected.

Of the patients, 118 (38.9%) reported having pre-anesthesia concerns. The most frequently expressed reasons for concern were not fully waking up from anesthesia (31.7%), not being fully asleep during surgery (31.0%), and feeling pain (30.7%); 25.1% of the patients stated that they had no concerns because they had been informed by the anesthesiologist. Of the patients, 70.0% stated that being awake during surgery would affect them. When asked about the most feared situation before surgery, 51.5% reported fearing none of them, 29.0% feared the surgery, 16.8% feared both the surgery and the anesthesia, and 12.5% feared only the anesthesia (Table 3).

Table 3
Preoperative concerns and reasons for fear (n = 303)

| Question / Response | n (%) |
|---|---|
| **Pre-anesthesia concern (Yes)** | 118 (38.9) |
| **Reasons for concern*** | |
| I will not fully wake up from anesthesia | 96 (31.7) |
| I will not be fully asleep during surgery | 94 (31.0) |
| I will feel pain | 93 (30.7) |
| Fear of death | 42 (13.9) |
| I will have nausea and vomiting | 30 (9.9) |
| Talking involuntarily | 23 (7.6) |
| Postoperative sore throat | 8 (2.6) |
| I was informed, I have no concerns | 76 (25.1) |
| **Would being awake during surgery affect you? (Yes)** | 212 (70.0) |
| **Most feared before surgery*** | |
| None | 156 (51.5) |
| Surgery | 88 (29.0) |
| Both surgery and anesthesia | 51 (16.8) |
| Anesthesia | 38 (12.5) |

*The total exceeds 100% as multiple options could be selected.

Of the 160 patients with previous general anesthesia experience, 83.8% reported being satisfied with their experience; the main reasons for dissatisfaction were postoperative pain (8.1%) and nausea (5.6%). Among the 21 patients with regional anesthesia experience, the satisfaction rate was 52.4%, with headache (14.3%) and discomfort from the operating room environment (14.3%) standing out among the reasons for dissatisfaction (Table 4).

Table 4
Satisfaction with previous general and regional anesthesia experiences

| **Response*** | **n (%)** |
|---|---|
| **Those with general anesthesia experience (n = 160)** | |
| Satisfied | 134 (83.8) |
| Postoperative pain | 13 (8.1) |
| Nausea | 9 (5.6) |
| Sore throat | 4 (2.5) |
| Not being clearly informed before the procedure | 4 (2.5) |
| Respiratory problems | 3 (1.9) |
| Awareness during surgery | 2 (1.2) |
| **Those with regional anesthesia experience (n = 21)** | |
| Satisfied | 11 (52.4) |
| Headache | 3 (14.3) |
| Discomfort from the operating room environment (sound, noise) | 3 (14.3) |
| Insufficient block duration (early onset of pain) | 2 (9.5) |
| Sensation of immobility after surgery | 2 (9.5) |
| Not being clearly informed before the procedure | 1 (4.8) |
| Fear of paralysis | 0 (0.0) |

*The total exceeds 100% as multiple options could be selected.

The proportion of patients who stated that they knew of PNB techniques for postoperative pain management was only 11.2% (n = 34). In contrast, 55.8% of the patients (n = 169) reported that they would accept PNB administration for anesthesia and/or analgesia during surgery. When concerns regarding PNBs were questioned, 70.0% of the patients stated that they had no idea and 13.9% stated that they had no fear; the most frequently expressed concern was the risk of permanent nerve damage (7.6%) (Table 5).

Table 5
Knowledge, acceptance, and concerns regarding peripheral nerve blocks (n = 303)

| Question / Response | n (%) |
|---|---|
| **Do you know of PNB techniques for postoperative pain management? (Yes)** | 34 (11.2) |
| **Do you accept PNB administration? (Yes)** | 169 (55.8) |
| **Concerns regarding PNBs*** | |
| I have no idea | 212 (70.0) |
| I have no fear | 42 (13.9) |
| Risk of permanent nerve damage | 23 (7.6) |
| Feeling pain | 18 (5.9) |
| Concern about being awake during surgery | 14 (4.6) |
| Fear of death due to complications | 13 (4.3) |

PNB: peripheral nerve block. *The total exceeds 100% as multiple options could be selected.

In comparative analyses, no significant association was found between awareness of PNBs and educational level (p = 0.220), sex (p = 0.182), age (p = 0.989), surgical history (p = 1.000), or anesthesia history (p = 1.000). The rate of accepting PNB administration was significantly lower in patients with pre-anesthesia concerns (44.1%) than in those without (63.2%) (p = 0.002); no significant association was found between educational level and acceptance (p = 0.094). The median age of patients with anxiety was significantly lower (median 36 years (26–50) versus 41 years (29–60); p = 0.020), and the frequency of anxiety was higher in patients without previous anesthesia experience (45.5% versus 33.7%; p = 0.049); no significant association was found between sex and anxiety (p = 0.229). Although patients who were aware of PNBs showed a greater tendency to prefer PNBs, the difference did not reach statistical significance (14.7% versus 5.6%; p = 0.059) (Table 6).

Table 6
Factors associated with awareness of, acceptance of, and preoperative anxiety regarding peripheral nerve block

| Comparison | Group | n/N (%) | p |
|---|---|---|---|
| PNB acceptance – Anxiety | With concern | 52/118 (44.1) | 0.002 |
| | Without concern | 117/185 (63.2) | |
| PNB acceptance – Education | No formal education | 10/20 (50.0) | 0.094 |
| | Primary education | 71/113 (62.8) | |
| | High school | 33/74 (44.6) | |
| | University | 55/96 (57.3) | |
| PNB awareness – Education | No formal education | 2/20 (10.0) | 0.220 |
| | Primary education | 13/113 (11.5) | |
| | High school | 4/74 (5.4) | |
| | University | 15/96 (15.6) | |
| PNB awareness – Sex | Female | 23/168 (13.7) | 0.182 |
| | Male | 11/135 (8.1) | |
| Not knowing any technique – Education | No formal education | 10/20 (50.0) | 0.002 |
| | Primary education | 28/113 (24.8) | |
| | High school | 20/74 (27.0) | |
| | University | 12/96 (12.5) | |
| Anxiety – Anesthesia history | No history | 61/134 (45.5) | 0.049 |
| | With history | 57/169 (33.7) | |
| Anxiety – Sex | Female | 71/168 (42.3) | 0.229 |
| | Male | 47/135 (34.8) | |
| Age (years) – Anxiety† | With concern | 36 (26–50) | 0.020 |
| | Without concern | 41 (29–60) | |

PNB: peripheral nerve block. The chi-square test was used for categorical variables, with the Yates continuity-corrected chi-square test for 2×2 tables or Fisher's exact test (when the expected cell count was < 5); †the Mann–Whitney U test (median [interquartile range]) was used for continuous variables.

The multivariate logistic regression model constructed for PNB acceptance was significant (likelihood ratio [LR] $\chi^2$=19.09; p = 0.024; Hosmer–Lemeshow p = 0.939; AUC = 0.64). After adjusting for age, sex,

educational status, comorbidity, anesthesia history, and awareness of PNBs, preoperative anxiety was the only variable independently predicting PNB acceptance; the likelihood of accepting PNB was significantly reduced in patients with anxiety (adjusted OR = 0.51; 95% CI 0.31–0.84; p = 0.007). Other associations observed in univariate analyses lost their significance in the multivariate model (Table 7).

Table 7
Multivariate logistic regression analysis of factors associated with PNB acceptance (n = 303)

| Variable | Adjusted OR (95% CI) | p |
|---|---|---|
| Age (per 10 years) | 0.97 (0.79–1.19) | 0.761 |
| Sex (female / male) | 0.82 (0.50–1.33) | 0.423 |
| Education: Primary (ref: no formal education) | 1.56 (0.57–4.23) | 0.385 |
| Education: High school | 0.75 (0.24–2.30) | 0.610 |
| Education: University | 1.12 (0.35–3.51) | 0.852 |
| Comorbidity (yes / no) | 0.68 (0.36–1.27) | 0.224 |
| Anesthesia history (yes / no) | 1.28 (0.75–2.17) | 0.367 |
| PNB awareness (yes / no) | 1.28 (0.59–2.79) | 0.529 |
| Preoperative anxiety (yes / no) | 0.51 (0.31–0.84) | 0.007 |

OR: odds ratio; CI: confidence interval; PNB: peripheral nerve block; ref: reference category. Model: LR $\chi^2$=19.09; p = 0.024; Hosmer–Lemeshow p = 0.939; AUC = 0.64.

The model constructed for preoperative anxiety was also significant (LR $\chi^2$=21.48; p = 0.006; Hosmer–Lemeshow p = 0.070; AUC = 0.66). In this model, the only variable independently predicting anxiety was the presence of comorbidity; the likelihood of anxiety was increased approximately 2.3-fold in patients with comorbidities (adjusted OR = 2.35; 95% CI 1.23–4.49; p = 0.010). Advanced age showed a borderline protective trend (OR = 0.81; 95% CI 0.65–1.00; p = 0.050). Female sex and the absence of anesthesia history, which appeared significant in univariate analysis, became borderline non-significant in the multivariate model (Table 8).

Table 8
Multivariate logistic regression analysis of factors associated with preoperative anxiety (n = 303)

| Variable | Adjusted OR (95% CI) | p |
|---|---|---|
| Age (per 10 years) | 0.81 (0.65–1.00) | 0.050 |
| Sex (female / male) | 1.53 (0.93–2.52) | 0.093 |
| Education: Primary (ref: no formal education) | 0.84 (0.29–2.39) | 0.745 |
| Education: High school | 1.24 (0.39–3.94) | 0.719 |
| Education: University | 1.04 (0.32–3.41) | 0.946 |
| Comorbidity (yes / no) | 2.35 (1.23–4.49) | 0.010 |
| Anesthesia history (yes / no) | 0.61 (0.35–1.04) | 0.068 |
| PNB awareness (yes / no) | 0.55 (0.24–1.27) | 0.164 |

OR: odds ratio; CI: confidence interval; PNB: peripheral nerve block; ref: reference category. Model: LR $\chi^2$=21.48; p = 0.006; Hosmer–Lemeshow p = 0.070; AUC = 0.66.

# DISCUSSION

This study provides new information on patients' awareness and acceptance of peripheral nerve blocks (PNBs) in the elective surgical setting. Although only a small proportion of participants had previous knowledge of PNBs, more than half stated that they would accept this technique after receiving appropriate information. Most patients who were reluctant to accept PNBs did not report a specific fear; instead, they simply indicated that they had no knowledge of the technique. These findings suggest that limited awareness, rather than negative perceptions, remains the main barrier to patient acceptance.

Our results are consistent with previous studies showing that public knowledge of anesthesia remains inadequate. General anesthesia was the best-known technique in our cohort, whereas almost one-quarter of the participants were unable to identify any anesthetic method. Similar findings have been reported from both developed and developing countries, where patients generally demonstrate greater familiarity with general anesthesia than with regional techniques (15–18). Turkish studies have reported comparable results, with limited awareness of regional anesthesia and poor overall knowledge before surgery (19, 20). Educational level improved general knowledge of anesthetic techniques in our study, but this effect was not observed for PNBs. This finding probably reflects the fact that PNBs remain relatively unfamiliar to the general public, regardless of educational background, because they are discussed far less frequently than general anesthesia in routine clinical practice and public media.

Patients obtained most of their information from previous personal experiences or from relatives who had undergone surgery. Internet-based sources were less frequently reported. This pattern suggests that

perceptions of anesthesia continue to be shaped mainly through informal social experience rather than structured medical education (21). Nearly half of the participants also acknowledged that stories from family members or friends influenced their choice of anesthetic technique. Similar observations have been described previously, where misconceptions and negative perceptions of regional anesthesia were shown to affect patient preferences (11, 12). In contrast, one of the most clinically relevant findings of our study was that more than 80% of patients considered the anesthesiologist's recommendation when making their decision. This emphasises the importance of the preoperative consultation as an opportunity to provide balanced information, address misconceptions, and support shared decision-making.

Despite the well-established clinical benefits of PNBs, only a small minority of participants initially identified peripheral nerve block as their preferred anesthetic technique. Fear of remaining awake during surgery appears to be one possible explanation. Similar concerns have been reported in previous Turkish studies, where many patients expressed a preference for general anesthesia because they were uncomfortable with the idea of being conscious during surgery (20). In our cohort, patients who were already familiar with PNBs were also more likely to consider choosing this technique, although this difference narrowly missed statistical significance. Taken together, these findings indicate that improving patient knowledge may positively influence acceptance, even though awareness alone is unlikely to explain patient preferences completely.

The clinical benefits of PNBs have been demonstrated consistently in the literature. Compared with general or neuraxial anesthesia, PNBs provide effective postoperative analgesia, reduce opioid requirements, facilitate early mobilisation, and support earlier discharge in appropriately selected patients (5–9). Despite these advantages, their routine use in elective surgery remains lower than expected (23).

Our findings help explain part of this discrepancy. Only 11.2% of patients had prior knowledge of PNBs, whereas more than half were willing to accept the technique after receiving information. This difference suggests that reluctance is often related to unfamiliarity rather than rejection of regional anesthesia itself. Similar observations have been reported by Matthey and colleagues, who showed that patients' opinions about regional anesthesia are frequently shaped by misconceptions and limited understanding rather than by previous negative experiences (11, 12).

Evidence supporting the clinical effectiveness of PNBs continues to expand (22). Randomized trials have shown superior postoperative recovery and improved analgesia compared with general anesthesia in ambulatory orthopaedic surgery (8, 9). More recent studies have reached similar conclusions. The AnAnkle trial demonstrated improved postoperative pain control with PNB compared with spinal anesthesia in ankle fracture surgery (24). Likewise, the ICAROS consensus recommended wider use of peripheral nerve blocks during hip and knee arthroplasty because of their favorable effects on postoperative outcomes (25). Meta-analyses published during the last few years have also confirmed

lower postoperative pain scores, prolonged analgesia, and reduced analgesic consumption after PNBs in foot and ankle surgery (26).

Despite this growing body of evidence, utilisation rates remain relatively low in routine clinical practice. Large national database studies have shown that the use of PNBs has increased over time, but the overall rate is still modest (10). This gap between evidence and daily practice is unlikely to be explained solely by technical limitations or clinician experience (27–30). Patient-related factors appear to play an equally important role.

Our results support this interpretation. Most participants were unfamiliar with PNBs, and many had never previously discussed this option with a healthcare professional. Importantly, more than four out of five patients reported that the anesthesiologist's recommendation influenced their decision regarding anesthetic technique. From a clinical perspective, this is one of the most relevant observations of the present study. It suggests that the preoperative assessment is not only a safety evaluation but also an opportunity to improve patient understanding and facilitate informed decision-making.

Another important issue is that patient education should present a balanced view of PNBs. Although these techniques provide excellent analgesia, patients should also be informed about potential limitations. One example is rebound pain, which may occur after block resolution, particularly following orthopaedic procedures (31). Recent network meta-analyses have shown that intravenous or perineural dexamethasone can substantially reduce this problem (32, 33). Discussing both the benefits and the limitations of PNBs may improve patient confidence and strengthen shared decision-making rather than simply increasing acceptance.

Our findings also align with recent national data from Türkiye. In a nationwide survey published by Kanat et al., patient refusal was identified as the most frequently reported reason why anesthesiologists did not perform regional anesthesia (34). This observation complements our results. If patients are unfamiliar with PNBs before the preoperative visit, refusal may simply reflect uncertainty rather than a genuine preference against regional techniques. Improving patient education before surgery may therefore remove an important and potentially modifiable barrier to wider implementation of PNBs.

Preoperative anxiety was reported by nearly 40% of the participants. The most common concerns were not waking up after anesthesia, remaining awake during surgery, and experiencing pain. These fears are consistent with previous reports from both Türkiye and other countries, where uncertainty about anesthesia remains a major source of perioperative anxiety (1, 2, 13, 20).

Younger patients experienced anxiety more frequently than older patients, and anxiety was also more common among individuals without previous anesthesia experience. Both findings are clinically plausible. Patients facing anesthesia for the first time may perceive the perioperative period as more uncertain, while previous exposure to anesthetic care may reduce fear through familiarity. Although several studies have reported higher anxiety levels among women, we did not observe a significant association between sex and preoperative anxiety. Differences in study populations and the use of a

single-question assessment rather than validated anxiety instruments may partly explain this discrepancy.

One of the most important observations of this study was the relationship between anxiety and acceptance of PNBs. Patients with preoperative anxiety were significantly less willing to accept a peripheral nerve block than those without anxiety. This association remained significant after adjustment for potential confounders in the multivariable logistic regression model. Although the cross-sectional design precludes causal inference, the findings suggest that anxiety may influence how patients respond to unfamiliar anesthetic techniques. Patients who are already worried about surgery or anesthesia may naturally be more hesitant to accept an option that they know little about.

The multivariable analysis further supported this interpretation. After adjustment for demographic and clinical characteristics, preoperative anxiety remained the only independent factor associated with reduced PNB acceptance. In contrast, variables such as age, educational level, previous anesthesia experience, and awareness of PNBs were no longer independently associated with acceptance. This finding indicates that emotional factors may have a greater influence on decision-making than factual knowledge alone. Simply providing information may therefore be insufficient for some patients if anxiety is not addressed during the preoperative consultation.

The second regression model identified comorbidity as the only independent predictor of preoperative anxiety. Patients with chronic diseases may perceive surgery as carrying greater risk and may therefore experience higher levels of anxiety before the procedure. This explanation is supported by previous studies reporting increased anxiety among patients with multiple medical conditions (2). In contrast, younger age and lack of previous anesthesia experience, which appeared significant in the univariate analyses, did not remain independent predictors after adjustment. These findings highlight the importance of considering confounding factors when interpreting simple group comparisons.

The predictive performance of both regression models was moderate, with AUC values of 0.64 and 0.66. This suggests that additional determinants of patient behavior were not captured in the present study. Factors such as health literacy, trust in healthcare professionals, previous experiences of relatives, cultural beliefs, personality traits, and individual risk perception may also influence both anxiety and acceptance of regional anesthesia. Future studies should incorporate these variables to develop more comprehensive prediction models.

From a clinical perspective, these findings have practical implications. The preoperative assessment should not be viewed solely as an opportunity to explain the technical aspects of PNBs. Identifying anxious patients, addressing their concerns, and providing clear, individualised counseling may improve informed decision-making and increase acceptance of regional anesthesia when clinically appropriate.

## Clinical Practice Implications

The present study has several implications for routine anesthetic practice. Awareness of PNBs was low, yet most patients expressed a willingness to accept the technique after receiving appropriate information. This finding highlights the value of the preoperative anesthesia consultation as an opportunity for patient education rather than simply medical assessment.

Structured counseling may be particularly beneficial for patients with limited knowledge of regional anesthesia or high levels of preoperative anxiety. Explaining the expected benefits, potential risks, and the perioperative course in clear, understandable language may help patients make more informed decisions and participate more actively in selecting an anesthetic technique. Such an approach may also facilitate wider implementation of PNBs in appropriately selected surgical patients.

## Study Limitations

Several limitations should be considered when interpreting our findings. First, this was a single-center study, which may limit the generalizability of the results to other institutions and populations. Patterns of patient knowledge and attitudes toward regional anesthesia may differ according to local clinical practice and sociocultural characteristics.

Second, the questionnaire was developed specifically for this study based on the available literature but was not subjected to formal psychometric validation. Consequently, measurement error cannot be completely excluded. In addition, preoperative anxiety was assessed using a single question rather than validated instruments such as the Amsterdam Preoperative Anxiety and Information Scale (APAIS) or the State-Trait Anxiety Inventory (STAI). Future studies using validated questionnaires may provide a more comprehensive assessment of anxiety and allow more direct comparisons with previous research.

Third, all interviews were conducted face to face. Although this approach ensured complete data collection and allowed participation by patients with limited literacy, interviewer bias and social desirability bias remain possible. Self-reported awareness of PNBs may also differ from objective knowledge because participants were not asked to complete a formal knowledge assessment.

Another limitation relates to sample size. Only a small number of participants had previous experience with regional anesthesia, limiting the interpretation of satisfaction analyses within this subgroup. Likewise, although the number of outcome events was acceptable for exploratory logistic regression, the moderate predictive performance of the models and the relatively wide confidence intervals indicate that the results should be interpreted cautiously and require external validation.

Finally, the cross-sectional design does not permit conclusions regarding causality. While anxiety was independently associated with lower acceptance of PNBs, it cannot be determined whether anxiety influenced acceptance or whether both outcomes were affected by other unmeasured factors.

## Conclusion

In summary, patients scheduled for elective surgery demonstrated limited awareness of peripheral nerve blocks despite generally favorable acceptance after receiving information. Preoperative anxiety was independently associated with lower acceptance of PNBs, whereas comorbidity was independently associated with higher levels of anxiety. These associations should be interpreted as exploratory because of the observational design and moderate predictive performance of the regression models.

The results emphasise the importance of effective communication during the preoperative assessment. Improving patient understanding of regional anesthesia and addressing anxiety at the same consultation may enhance informed decision-making and increase acceptance of PNBs when clinically appropriate.

Future multicenter prospective studies should evaluate whether structured educational interventions and anxiety-focused counseling improve patient knowledge, acceptance of regional anesthesia, and perioperative outcomes .

# Abbreviations

**ASA**
American Society of Anesthesiologists
**CI**
Confidence intervals
**IQR**
Interquartile range
**OR**
Odds ratios
**PNB**
Peripheral nerve block

# Declarations

### Ethics approval and consent to participate

This study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Scientific Research Ethics Committee of Giresun Training and Research Hospital (Approval date: 03 April 2024; Decision No: 02). Written informed consent was obtained from all participants prior to enrollment.

### Consent for publication

Not applicable.

### Availability of data and materials

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

**Competing interests**

The authors declare that they have no competing interests.

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The authors received no specific funding for this work.

**Authors' contributions**

YŞ conceived and designed the study. YŞ, AA, BOK, and ETY contributed to data collection. YŞ performed the statistical analysis and interpreted the data. YŞ drafted the manuscript. AA, BOK, and ETY critically revised the manuscript for important intellectual content. All authors read and approved the final manuscript.

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# Figures

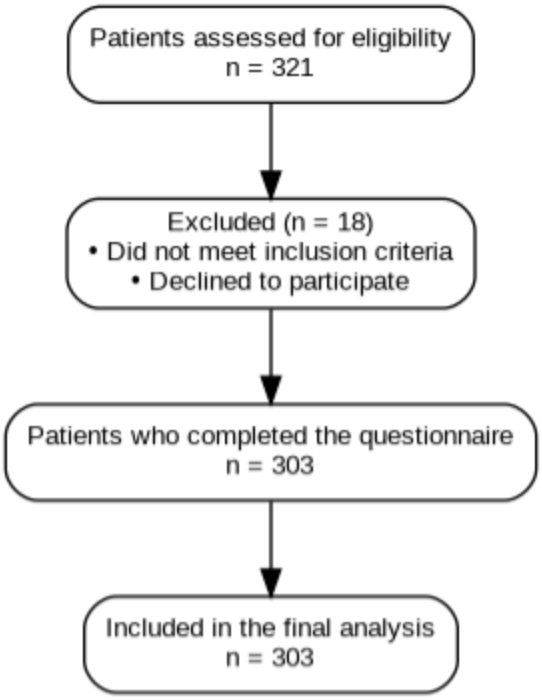



**Figure 1**

**Flow diagram of patient inclusion**

# Supplementary Files

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- SupplementaryQuestionnaire.pdf