



ORIGINAL ARTICLE

Perioperative use of fascial plane blocks; anesthesiology and reanimation physicians' approach in Türkiye: A national survey study

Türkiye'de çalışan anesteziyoloji ve reanimasyon hekimlerinin fasyal plan bloklarının perioperatif kullanımına yaklaşımları: Ulusal anket çalışması

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Summary

Objectives: Our aim was to assess the approach of Turkish Anesthesiology and Reanimation Specialists to the perioperative use of truncal/fascial plane blocks (FPB) in various surgeries. A survey was designed to evaluate the perioperative management of FPBs.

Methods: Anesthesiology and Reanimation specialists and residents in various hospitals in Türkiye were surveyed on a voluntary basis. We contacted them between June 1 and September 10, 2022, using email and smartphone messenger applications. They were asked to complete a questionnaire form regarding the perioperative management of FPBs.

Results: A total of 242 anesthesiology specialists and residents responded to the survey. Most participants (42.3%) were anesthesiology specialists in 3rd level (academic, teaching, or university) hospitals. 90% of the participants use these blocks in their clinical practice. The primarily used FPBs were the erector spinae plane (ESP) (629 responses in all categories).

Conclusion: The anesthesia and reanimation specialists in Türkiye are reasonably familiar with FPBs and use these blocks frequently in clinical practice. The primarily preferred blocks seem to be ESP and TAP blocks. Lack of equipment is a major reason for the non-performance of FPBs. There is still a lack/need for additional education and training for these blocks.

Keywords: Fascial Plane Blocks; local anesthetic; physician survey; perioperative management; postoperative analgesia; truncal blocks; ultrasound guided.

Özet

Amaç: Türk Anesteziyoloji ve Reanimasyon Uzmanlarının truncal/fasyal plan bloklarının (FPB) çeşitli ameliyatlarda kullanımına yaklaşımlarını değerlendirmekti. FPB'lerin perioperatif yönetimini değerlendirmek için bir anket tasarladık.

Gereç ve Yöntem: Türkiye'deki çeşitli hastanelerde çalışan Anesteziyoloji ve Reanimasyon uzmanları ve asistanlarına gönüllü katılımlı bir anket uyguladık. Katılımcılarla 1 Haziran – 10 Eylül 2022 tarihleri arasında e-posta ve akıllı telefon mesajlaşma uygulamaları kullanarak iletişime geçtil. FPB'lerin perioperatif yönetimi ile ilgili bir anket formu doldurmalarını istedik.

Bulgular: Ankete 242 anesteziyoloji uzmanı ve asistan yanıt verdi. Katılımcıların çoğu (%42.3) 3. basamak (eğitim ve araştırma veya üniversite) hastanelerde anestezi uzmanı olarak çalışmaktadır. Katılımcıların %90'ı bu blokları klinik uygulamalarında kullanmaktadır. Öncelikli olarak kullanılan gövde bloğu erktör spina planı (ESP) bloğuydu (629 yanıt).

Sonuç: Türkiye'deki anestezi ve reanimasyon uzmanları FPB'lere oldukça așınadır ve bu blokları klinik uygulamada sıkılıkla kullanmaktadır. Anestezistlerin öncelikli tercih ettiği blokların ESP ve TAP bloğu olduğu tespit edildi. Ekipman eksiksliği, FPB'lerin uygulanmamasının önemli bir nedenidir. Bu bloklar için ek eğitim ve öğretim ihtiyacı vardır.

Anahtar sözcükler: Anestezi uzmanı; lokal anestezikler; postoperatif ağrı; anket; reyjonal anestezi; sinir bloğu; ultrason.

Introduction

The use of truncal and fascial plane blocks has increased in recent years for perioperative management of pain. Truncal and fascial plane blocks (FPB)

have gained popularity in Türkiye regarding clinical use and research area as well. The PROSPECT guidelines and ERAS protocols extensively recommend these plane blocks in many surgeries for postopera-

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tive analgesia.^[1–6] The Turkish Regional Anesthesia Society (RAD) and the Turkish Society of Anesthesiology and Reanimation promote these blocks by organizing lectures in workshops, meetings, and conferences.

The variety of these blocks is increasing over time, and new techniques and approaches are defined every year. Certain types of these blocks are more popular and more studied; however, there are also rarely used and researched blocks, and for some blocks, there is a decrease in popularity. Perioperative management of truncal/fascial plane blocks may become challenging in patients undergoing various surgical procedures due to the increasing variation in these types of blocks.

We aimed to obtain information about the general use and perioperative management of truncal/fascial plane blocks in Türkiye among anesthesiology and reanimation specialists. Our goal was to identify the contemporary practices of Turkish anesthesiologists regarding the use of FPBs in patients undergoing surgery. We designed a survey to assess this. Our secondary aim was to increase awareness about the use of various and new FPBs for the purpose of perioperative analgesia.

Material and Methods

The study is a questionnaire-based survey approved by the Ethics Committee of Sakarya University (Decision no: 02/02/2022-102079-05) and was conducted in accordance with the Declaration of Helsinki. We invited Anesthesiology and Reanimation specialists and residents to complete a questionnaire on a voluntary and anonymous basis. The survey was distributed to anesthesiologists via email and smartphone messaging applications. We expected participants to respond between June 1 and September 10, 2022.

The questionnaire comprised 21 prospective, one-choice, or multiple-choice questions, as detailed in Table 1. The questions focused on five main subjects:

1. Demographic/professional characteristics of the participants.
2. Education methods for FPBs.
3. Reasons and frequency of performance of FPBs.
4. Use and preferences of truncal/fascial plane blocks in various surgeries.
5. Use and preferences of local anesthetic drugs in various truncal/fascial plane blocks.
6. Interventional procedure credits/performance scores of FPBs.

Table 1. The questions of the survey

1. Gender
2. Academic title
3. Institution
4. Time of professional experience in your specialty (years)
5. How often do you apply FPBs for perioperative and/or postoperative analgesia in general?
6. If you are not applying the FPBs, please state the reason.
7. Have you been educated or trained in FPBs?
8. Do you add an adjuvant to the local anesthetic? If yes, which one is your preference?
9. Which local anesthetic do you prefer to use in FPBs for perioperative analgesia?
10. In open abdominal surgery, which FPBs do you prefer for perioperative and/or postoperative analgesia?
11. In laparoscopic abdominal surgery, which FPB do you prefer for perioperative and/or postoperative analgesia?
12. In thoracotomy, which FPBs do you prefer for perioperative and/or postoperative analgesia?
13. In sternotomy, which FPBs do you prefer for perioperative and/or postoperative analgesia?
14. In neck surgery, which FPBs do you prefer for perioperative and/or postoperative analgesia?
15. In breast surgery, which FPBs do you prefer for perioperative and/or postoperative analgesia?
16. In spinal surgery, which FPBs do you prefer for perioperative and/or postoperative analgesia?
17. What is your opinion about the interventional procedure credits for the FPBs?
18. What is the reason for preferring FPBs for perioperative and/or postoperative analgesia?

Table 2. Demographic characteristics, academic, institutional, and professional information of participants

Variable	n	%
Gender		
Female	129	54
Male	110	46
Academic degree		
Resident	62	25.9
Specialist physician	101	42.3
Assistant professor	17	7.1
Associate professor	45	18.8
Professor	14	5.9
Institutional information		
Level 2 hospital	40	16.7
Level 3 hospital (university hospital, educational and research hospitals)	183	76.3
Private hospital	17	7.1
Experience in profession (years)		
Residency	53	22.1
0–5	53	22.1
5–10	40	16.7
10–15	43	17.9
15 years and over	51	21.3

For the nomenclature of the FPBs used in clinical practice, we primarily referred to the recent ASRA-ESRA Delphi consensus on abdominal wall, paraspinal, and chest wall blocks.^[7] Nevertheless, we included in the questions the more frequently studied blocks used in clinical practice.

The sample size of this study was determined using the SurveyMonkey sample size calculator program, an open-source tool available online.^[8] We estimated the number of specialists or residents currently working in Türkiye as 10,000, based on information from the national society of anesthesiologists. Statistical analysis of the study data was performed using SPSS 20 (Statistical Package for Social Sciences) software (IBM Corp., Armonk, NY). Descriptive statistical methods (mean, standard deviation, frequency) were used to evaluate the study results.

Results

A total of 242 participants responded to the questionnaire; one participant was excluded from the

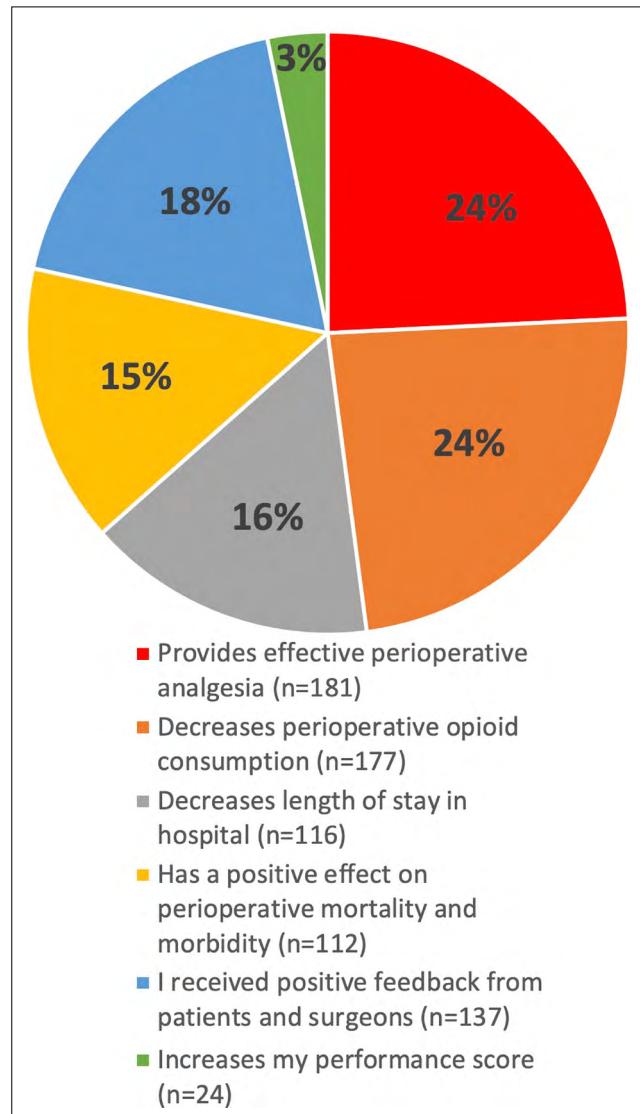


Figure 1. Illustration showing the variety of reasons anesthesiologists prefer to use FPBs for perioperative and/or postoperative analgesia.

Responses with a rate of less than 1% are not included in this figure.

study due to lack of data, leaving 241 participants enrolled. With a population size of 10,000, the confidence interval was set at 95%, and the margin of error was calculated at 6.3%.

The demographic characteristics of the participants are summarized in Table 2. As our study was designed to be descriptive, no comparisons were made. The majority of the participants were anesthesiology specialist physicians working in 3rd level (University or Educational) hospitals (42.3%).

The most frequent reason for choosing FPBs was the belief that they provide adequate perioperative analgesia. Among the 231 participants who responded to this question, 181 (78.4%) chose

Table 3. Rates of most frequently performed FPBs for specific types of surgical procedures and participants who did not prefer to perform FPBs for these procedures

Type of surgery	Most frequently used FPB	Second frequently Used FPB	Third frequently used FPB	Participants not preferring FPBs
Open abdominal surgery (234)	TAP block (185, 79.1%)	ESP block (114, 48.7%)	Rectus sheath block (71, 30.3%)	32 (13.7%)
Laparoscopic abdominal surgery (231)	TAP block (144, 62.3%)	ESP block (77, 33.3%)	Subcostal TAP block (60, 26%)	51 (22.1%)
Thoracotomy (231)	ESP block (172, 74.5%)	Paravertebral block (88, 38.1%)	Serratus plane block (61, 26.4%)	31 (13.4%)
Sternotomy (228)	ESP block (61, 26.8%)	Paravertebral block (39, 17.1%)	Intercostal block (31, 13.6%)	129 (56.6%)
Neck surgery (228)	Cervical plexus block (85, 37.3%)	ESP block (7, 3.1%)	Paravertebral block (4, 1.8%)	137 (60.1%)
Breast surgery (232)	PECS-2 (141, 60.8%)	PECS-1 (128, 55.2%)	ESP block (95, 40.9%)	34 (14.7%)
Spinal surgery (229)	ESP block (103, 45%)	TLIP (45, 19.7%)	Paravertebral block (26, 11.4%)	96 (41.9%)

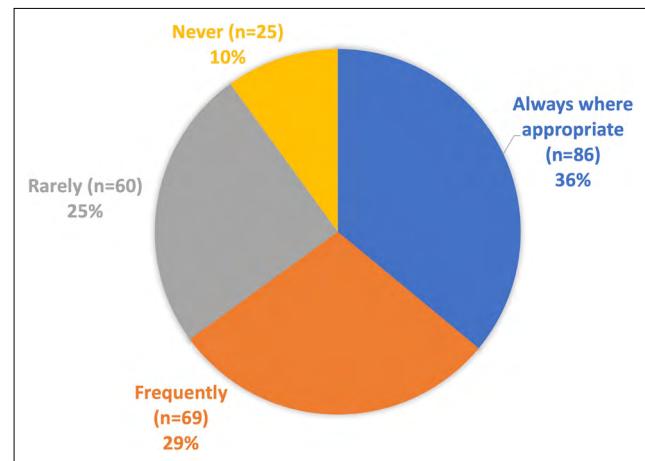
More than one response could be stated in this part of the questionnaire; therefore, the number of responses may exceed the total number of respondents. TAP: Transversus abdominis plane; ESP: Erector spinae plane; TLIP: Thoracolumbar interfascial plane; PECS: Pectoral nerves block.

this reason. The distribution of reasons stated by anesthesiologists for preferring FPBs is presented in Figure 1.

The most common response regarding the frequency of performing FPBs was, "I always perform FPBs if there is a block that is appropriate for the patient" (86 respondents, 35%). Among the participants, 25 (10.4%) stated they do not prefer to use FPBs in clinical practice. The frequency of FPB performance is summarized in Figure 2.

The subdivision of participants who prefer FPBs in all eligible patients showed that 31 (36%) of them were associate professors, 26 (30.2%) were specialist physicians, and 18 (20.9%) were residents. Among those who did not prefer to perform FPB, 19 (76%) were specialist physicians, 5 (20%) were residents, and one (0.04%) was a professor.

The most common reason for not performing FPBs, as stated by anesthesiologists, was "lack of equipment" (59 responses, 25.6%). The second most common reason was the surgical team's reluctance to use these blocks (54 responses, 23.4%). The third most common reason was the lack of training in these blocks (45 responses, 19.5%), as shown in Figure 3.

**Figure 2.** A graphical representation of how frequently fascial/truncal plane blocks are applied by the survey respondents.

The participants were asked about the fascial plane block they preferred in seven different surgery types. The most common response was the erector spinae plane (ESP) block for all types of surgeries (629 responses in all categories) (Fig. 4). ESP block was stated as the first-choice analgesia method in thoracotomy (172 responses), sternotomy (61 responses), and spinal surgery (103 responses). The transversus abdominis plane (TAP) block was the second most preferred FPB (329 responses in all categories). TAP block was the most preferred block in open abdominal (185 responses) and laparoscopic abdominal surgeries (144 responses). The rates of FPBs preferred in various surgeries are given in Table 3.

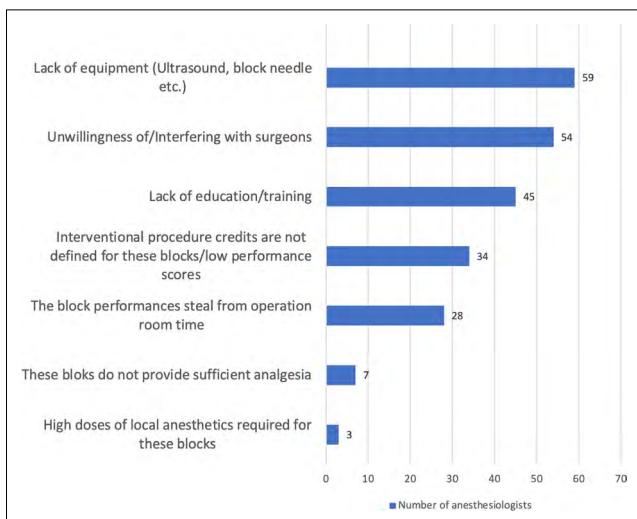


Figure 3. Chart depicting the reasons anesthesiologists cited for not preferring fascial plane blocks in their practice.

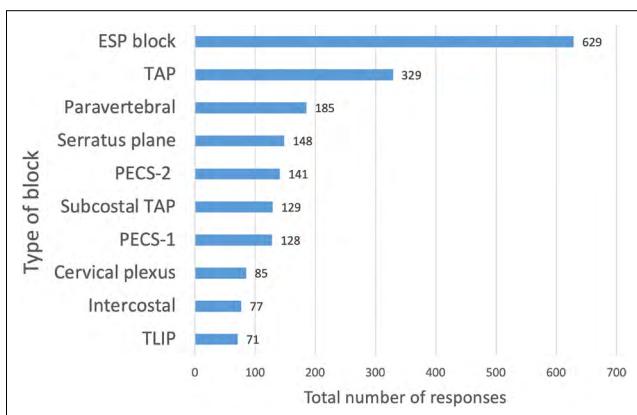


Figure 4. A ranked list of the top ten most commonly applied blocks, as indicated by the survey responses.

The most common surgeries in which the participants preferred FPBs as a perioperative analgesia method were open abdominal surgeries (370 responses), breast surgery (364 responses), thoracotomy (321 responses), and laparoscopic abdominal surgery (281 responses). The surgical procedures in which FPBs were least frequently applied were neck surgery (96 responses) and sternotomy (131 responses).

As the "first-choice local anesthetic" used in FPBs, participants mainly stated that they preferred bupivacaine at a concentration of 0.25% (113 participants, 46.8%). The second most common "first-choice local anesthetic" was a bupivacaine-lidocaine mixture (51 participants, 21.6%), and the third most common was bupivacaine with a concentration of 0.5% (48 participants, 19.9%). Prilocaine was not stated as a "first-choice local anesthetic" (Table 4). The majority of participants (189 participants,

Table 4. Distribution of responses regarding the preferred local anesthetics and concentrations used for FPBs

Preferred local anesthetic in FPBs for perioperative analgesia?	First choice (n)	Second choice (n)	Third choice (n)
Bupivacaine 0.5%	48	26	13
Bupivacaine 0.25%	113	37	10
Bupivacaine 0.125%	15	20	16
Mixture of bupivacaine and lidocaine	51	53	22
Lidocaine 2%	2	13	16
Lidocaine 1%	2	19	14
Prilocaine 2%	0	15	8
Prilocaine 1%	0	8	15

84.4%) did not prefer adding adjuvants to local anesthetics. The first-choice adjuvant was opioids (23 participants, 9.8%), and the second-choice adjuvant was corticosteroids (21 participants, 8.9%).

Of the 240 participants who responded to the question regarding education/training in FPBs, 124 (51.7%) stated that they were educated during residency, which was the most common response. The second most common education/training method was watching videos on YouTube (83 participants, 34.4%). The number of participants who stated they had no education about FPBs was 18 (7.5%). The summary of education methods is given in Figure 5.

As a final question, we asked the participants about their thoughts on interventional procedure credits/performance scores for payment per intervention. The majority of participants (111 participants, 47.4%) stated that high interventional procedure credits/performance scores for FPBs may increase motivation to perform these blocks. Additionally, a considerable portion of participants (99 participants, 42.3%) stated that the patient's benefit is more important than interventional procedure credits/performance scores (Fig. 6).

Discussion

The present study demonstrated that Turkish Anesthesiology and Reanimation specialists are reasonably familiar with truncal/fascial plane blocks (FPB) and frequently use these blocks in clinical practice.

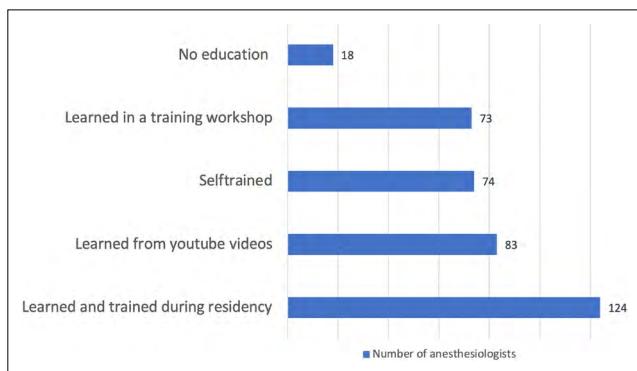


Figure 5. Diagram indicating the educational status of the participants in relation to their knowledge and training in fascial plane blocks.

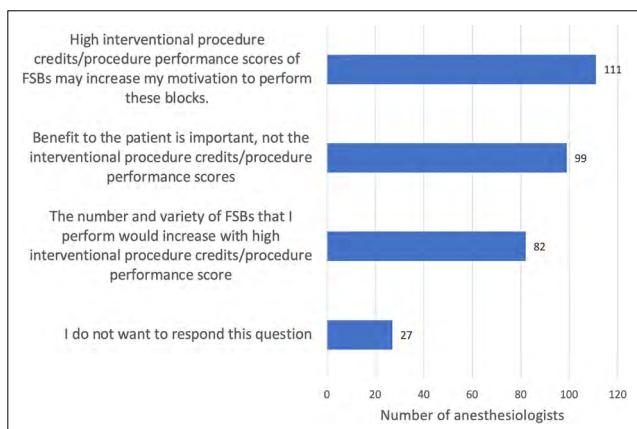


Figure 6. A breakdown of the responses concerning the opinions of anesthesiologists on the impact of interventional procedure credits and procedure performance scores on the use of fascial plane blocks (FPB).

Over 60% of the participants reported frequent use of FPBs for perioperative analgesia. The majority also stated that FPBs provide effective postoperative analgesia, reduce opioid consumption, and decrease length of hospital stay.

The most commonly used FPB was the erector spinae plane (ESP) block, identified as an analgesic method in all types of surgeries mentioned in the survey. Anesthesiologists in Türkiye prefer the ESP block as the first-choice method in thoracotomy, sternotomy, and spinal surgeries.

The transversus abdominis plane (TAP) block was also frequently mentioned and identified as the first-choice block in abdominal surgeries. TAP and ESP blocks were the first and second choices, respectively, in both laparoscopic and open abdominal surgeries. The rectus sheath block was the third choice in open abdominal surgery. TAP and ESP blocks are extensively studied and discussed in the literature. The

TAP block, with a longer history, was first described by Rafi as an abdominal field block in 2001. The ESP block, introduced by Forero as an analgesic technique for chronic pain in 2016,^[9–11] has rapidly gained popularity, surpassing the TAP block in a short period. A comparison of PubMed research for TAP and ESP blocks showed that there are 1732 results for the ESP block versus 1563 for the TAP block as of September 2022. The ESP block has a broader range of indications than the TAP block, encompassing cervical, thoracic, and lumbar levels.^[12]

Paravertebral blocks are also popular for thoracic surgery and sternotomy, ranking second for these procedures. A paravertebral block, performed deeper than an ESP block, is a more challenging technique.^[13] Pectoral nerve blocks (PECS) are the first-choice blocks in breast surgery, with PECS-II block preferred over the PECS-I block. ESP block ranks third in breast surgery, following PECS-II and PECS-I blocks.

The thoracolumbar interfascial plane (TLIP) block, relatively newer compared to the TAP block and paravertebral blocks,^[14] has a well-defined analgesic effect for spine surgery as evidenced in randomized controlled studies and meta-analyses, mainly accumulated in recent years.^[15–19] Although the first introduction of the TLIP block is similar in time to the ESP block, the number of publications about the TLIP block is significantly lower than those for the ESP block. One study reported a superior analgesic effect of the ESP block compared to the TLIP block in lumbar spine surgery.^[20] However, the TLIP block maintained reasonable popularity in spinal surgery in the survey, with the paravertebral block being the third choice for this type of surgery.

The primary reasons for not performing FPBs among anesthesiologists in our survey were lack of equipment, resistance or unwillingness of surgeons, and lack of education. Education and training in FPBs require a continuous pathway due to the increasing variety and the constant introduction of new techniques and approaches. Proficiency in using ultrasound equipment and a thorough knowledge of relevant anatomy are crucial, enabling the anesthesiologist to tailor analgesia to surgical requirements.^[21] Periodic education and training are also vital, as serious complications

such as pneumothorax associated with FPBs may occur due to improper block selection, inadequate needle handling, and targeting.^[22]

Simulation-based education and periodical training courses can be effective in decreasing procedure time, reducing the number of needle punctures, and improving accurate targeting for a successful block.^[23] The Turkish Society of Regional Anesthesia has been promoting education recently by initiating training courses dedicated to FPBs.^[24] The undefined interventional procedure credits/performance scores for FPBs and the concern that FPBs may extend operation times were also significant reasons for their non-performance. The beliefs that FPBs provide insufficient analgesic effect and require high doses of local anesthetics were less common reasons.

The optimal volume, dose, and type of local anesthetic drug and adjuvants for most FPBs remain controversial. In this survey, participants mostly preferred bupivacaine at a concentration of 0.25% for perioperative analgesia. A minority of participants accepted opioids and corticosteroids as adjuncts to local anesthetics; however, a substantial proportion did not prefer adding adjuvants to local anesthetics in FPBs. Bupivacaine 0.25% is the first-choice local anesthetic for many FPBs.^[25] Ropivacaine, levobupivacaine, and liposomal bupivacaine have also been studied, particularly in TAP blocks.^[26-29] Recent studies have explored potential adjuvants in FPBs, such as dexmedetomidine, dexamethasone, and ketamine.^[30] This topic is likely to remain a research subject in the near future. The survey also revealed that participants seem motivated to perform FPBs with newly defined interventional procedure credits/performance scores for novel FPBs, which are currently absent from many of the FPBs in the Turkish interventional procedure scoring and credit lists.

The study's limitations include that the survey was not conducted face-to-face, and a specific time for answering the questions could not be set for each participant. Additionally, the exact number of people the survey was sent to and the response rate are unknown. Another limitation is that the survey was distributed to members of the regional anesthesia association, which likely increased the response rate among participants

who primarily use these methods. Physicians who regularly perform these interventions are more likely to respond, while those who do not use these methods are less inclined to answer. Therefore, the reported rates of these interventions may be higher than their actual performance in the general population.

Conclusion

In conclusion, Anesthesiology and Reanimation specialists in Türkiye are familiar with fascial plane blocks, and the use of FPBs for perioperative analgesia is reasonably common in clinical practice. The favorite FPBs among Turkish Anesthesiology and Reanimation specialists appear to be the ESP and TAP blocks. The most preferred local anesthetic is bupivacaine at a concentration of 0.25% without the addition of any adjuvants.

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