Dicle Tıp Dergisi / Dicle Med J (2025) 52 (4) : 783-789

www.diclemedj.org

Original Article / Özgün Araştırma

The Impact of Educational Level on Anesthesia Preference in Caesarean Section Surgeries

Murat Sahin[1], **Kamuran Uluc**[2], **Mustafa Bilgehan Ayik**[1], **Soner Kina**[3]

1 Clinic of Anesthesiology and Reanimation, Muş State Hospital, Muş, Türkiye

2 Clinic of Intensive Care, Muş State Hospital, Muş, Türkiye

3 Department of Anesthesiology and Reanimation, Kafkas University Faculty of Medicine, Kars, Türkiye

Received: 22.04.2025; Revised: 23.10.2025; Accepted: 27.10.2025

Abstract

Objective: In recent years spinal anesthesia has been preferred to general anesthesia for caesarean section. However, some patients opt for general anesthesia due to concerns such as fear of pain during surgery, postoperative headache, and lack of knowledge about anesthesia techniques. The primary aim of this study is to determine the impact of the educational level of pregnant women and their partners on anesthesia preferences for elective caesarean section.

Methods: Our study is a prospective observational cohort study, including 186 patients over the age of 18 who underwent elective cesarean section at Muş State Hospital between May 6, 2024, and July 31, 2024. The patients were divided into two groups according to their anesthesia preferences: Spinal (n=93) and General (n=93). Education level, age, BMI (Body Mass Index), gestational week, medical history and parity of the patients and their partners were recorded.

Results: Significant differences in anesthetic preferences were found according to the educational level of the women. Statistically significant differences in anesthesia preferences were observed between university graduates and middle school graduates ($p < 0.001$ and $p = 0.004$ respectively). Similarly, significant differences were found between partners' educational levels, especially between university and primary school graduates ($p < 0.001$ and $p = 0.019$ respectively). The effects of BMI, age, gestational week and parity on anesthesia preferences were not found to be significant ($p > 0.05$).

Conclusion: The study shows that educational level plays an important role in anesthesia preferences for caesarean section. Individuals with higher levels of education were found to prefer spinal anesthesia. Effective implementation of preoperative education processes is crucial for informed decision making and patient satisfaction.

Keywords: Caesarean section, Education level, General anesthesia, Spinal anesthesia, Pregnancy

DOI: 10.5798/dicletip.1840892

Correspondence / Yazışma Adresi: *Murat Şahin, Muş State Hospital, Clinic of Anesthesiology and Reanimation Muş, Türkiye e-mail: mrtshn52@gmail.com*

Sezaryen Ameliyatlarında Eğitim Durumunun Anestezi Tercihine Etkisi

Öz

Amaç: Son yıllarda, sezaryen ameliyatlarında spinal anestezi, genel anesteziye kıyasla daha fazla tercih edilmektedir. Ancak, bazı hastalar cerrahi işlem sırasında ağrı hissetme korkusu, postoperatif baş ağrısı ve anestezi teknikleri hakkında bilgi eksikliği gibi nedenlerle genel anesteziyi tercih etmektedir. Bu çalışmanın ana amacı, gebelerin ve eşlerinin eğitim düzeylerinin elektif sezaryen operasyonlarında anestezi tercihleri üzerindeki etkilerini belirlemektir.

Yöntemler: Bu prospektif gözlemsel kohort çalışması 6 Mayıs-31 Temmuz 2024 tarihleri arasında Muş Devlet Hastanesi'nde yapılmış olup, elektif sezaryen ameliyatı yapılacak 18 yaş üstü 186 hasta dahil edilmiştir. Hastalar, anestezi tercihlerine göre iki gruba ayrılmıştır: Spinal Anestezi (n=93) ve Genel Anestezi (n=93). Anestezi poliklinik muayenesinde; hastaların ve eşlerinin eğitim düzeyleri, yaş, VKI(Vucud Kitle Indexi), gebelik haftası, ek hastalık öyküsü ve kaçıncı gebeliği olduğu sorularak bu bilgiler kaydedildi.

Bulgular: Kadınların eğitim düzeylerine göre anestezi tercihlerinde anlamlı farklılıklar bulunmuştur. Üniversite ve ortaokul mezunları arasında anestezi tercihi açısından istatistiksel olarak anlamlı farklılıklar gözlenmiştir ($p < 0,001$, $p = 0,004$ sırasıyla). Benzer şekilde, eşlerin eğitim düzeyleri ile gebelerin anestezi tercihi arasında, özellikle üniversite ve ilkokul mezunları arasında anlamlı farklılıklar bulunmuştur($p < 0,001$, $p = 0,019$ sırasıyla). VKI, yaş, gebelik haftası ve paritenin anestezi tercihi üzerindeki etkileri anlamlı bulunmamıştır ($p > 0.05$).

Sonuç: Eğitim düzeyinin sezaryen operasyonlarında anestezi tercihi üzerinde önemli bir rol oynadığını göstermektedir. Daha yüksek eğitim düzeyine sahip bireylerin spinal anesteziyi tercih ettikleri görülmüştür. Preoperatif bilgilendirme süreçlerinin etkin bir şekilde yürütülmesi, bilinçli karar alma ve hasta memnuniyeti açısından kritik öneme sahiptir.

Anahtar kelimeler: Sezaryen, eğitim durumu, genel anestezi, spinal anestezi, gebelik.

INTRODUCTION

In cesarean surgeries, spinal anesthesia is preferred more frequently compared to general anesthesia.Spinal anesthesia is more commonly chosen for caesarean sections since it allows early interaction between the mother and baby, and is generally preferred due to its benefits in recovery speed and overall maternal and neonatal outcomes[1,2].

Regional anesthesia techniques allow expectant mothers to remain awake during the surgery and experience the moment of their baby's birth. This contributes to a closer mother-child relationship and also reduces the necessity for pain management after surgery., allowing mothers to return to daily activities more quickly[3]. However, some patients may have concerns during the procedure, such as the fear of experiencing pain, postoperative headache, and a desire to avoid the sounds of the operating room. Another contributing factor is the inadequate familiarity with different types of anesthesia, a relative's negative experience with spinal anesthesia, fear of developing a herniated disc or paralysis after the procedure, and concerns about persistent low back pain cause some patients to prefer general anesthesia[4]. To address these concerns, the pros and cons of various anesthesia methods should be clearly explained to patients. Well-informed patients tend to feel more content with the anesthesia method they selected after the procedure[5]. A more extensive educational background might contribute to increased knowledge about healthcare options, thereby affecting anesthesia-related choices[6].

We hypothesize that individuals with higher educational attainment are more likely to prefer spinal anesthesia.This research primarily focuses on comparing the level of education patients and their partners with their preferences for anesthetic technique. The study further examines the relationship between

certain demographic and clinical variables—including parity, BMI, maternal age, gestational duration, and underlying medical issues—and anesthesia selection

METHODS

Study Design and Participants

In line with the ethical principles of the Declaration of Helsinki, this study was structured as a prospective observational cohort. Ethical approval was received from University of Kafkas Non-interventional Ethics Committee (decision number: 418, date: 30.04.2024), and voluntary informed consent was collected from all subjects. Patients aged 18 years and above who were scheduled for elective caesarean section and who applied to Muş Hospital between May 6 ,2024, and July 31,2024 were selected. Emergency caesarean sections, patients with complications during anesthesia or surgery such—as failed spinal anesthesia requiring conversion to general anesthesia, high spinal block, allergic reaction to anesthetic agents, bladder or bowel injury, uterine atony— as well as individuals with language or communication difficulties and those who declined participation were excluded from the study. It was estimated that 186 individuals would be needed to achieve sufficient statistical power for the study, assuming a large effect size (effect size=0.8) between the groups, with an alpha significance level of 0.05 and 95% power. After the advantages and disadvantages of the anesthetic techniques were explained to both the patients and their spouses during the anesthetic clinic examination, data were collected on the patients' and their spouses' level of education, age, weight, height, gestational age, comorbidities such as hypertension, diabetes mellitus, thyroid disorders, asthma, and cardiovascular diseases were also recorded during the preoperative evaluation, parity, and preferred anesthetic technique. After the information session, patients were classified into two groups depending on the type of anesthesia they preferred: Spinal anesthesia (n=93) or General anesthesia (n=93). On the day of surgery, patients whose preferences changed after being informed by the anesthetist in the operating room were reassigned to the appropriate group.

Anesthesia Procedures

All patients received either spinal or general anesthesia based on their preference following preoperative counseling by the anesthesiologist. A 25-gauge Quincke spinal needle was used to administer spinal anesthesia in the interspace of L3–L4 or L4–L5 while the patient sat. After verifying cerebrospinal fluid flow, 10–12 mg of 0.5% hyperbaric bupivacaine was administered intrathecally. As per the protocol, patients were put in the supine position with left uterine displacement to prevent aortocaval compression, and oxygen supplementation through face mask was given. General anesthesia was initiated by administering lidocaine 1 mg/kg intravenously to reduce injection pain. This was followed by propofol 2 mg/kg for induction and rocuronium 0.6 mg/kg to facilitate endotracheal intubation. Anesthesia was maintained with 1–2% sevoflurane in a 50:50 oxygen–air mixture. Fentanyl 1 μg/kg was administered after the delivery of the newborn to avoid neonatal respiratory depression. Standard ASA monitoring was applied to all patients. Hypotension under spinal anesthesia was managed with intravenous fluids and ephedrine when necessary. All anesthetic procedures were performed by experienced anesthesiologists.

Statistical Analysis

The sample size for the study was calculated using G Power 3.1.94, based on the number of participants, means and standard deviations from similar previous studies. Statistical analyses were selected according to the hypotheses of the study. Statistical analysis was

performed using SPSS version 24.0 (IBM Corp., Armonk, NY, USA), with a 95% confidence interval and a 5% margin of error. Initially, descriptive statistics were employed to characterize the socio-demographic features of the participants, while analyses involving relationships between variables were excluded at this stage. Later, when relational analyses were conducted, tests for differences and associations were applied.Before carrying out the tests, the distribution of the data was examined. Normality tests, including Kolmogorov-Smirnov and Shapiro-Wilk, were conducted and showed that the data did not adhere to a normal distribution Given the non-normality revealed by skewness and kurtosis, a non-parametric test was appropriate for analyzing differences. Similarly, To evaluate associations, Fisher's exact test was utilized.

RESULTS

At the outset of the study, 193 patients met the eligibility criteria and were enrolled; however, 7 individuals decided to withdraw their consent on the day of surgery for personal reasons. As a result of these withdrawals, the research was successfully completed with 186 participants whose data were included in the final analysis (Figure 1).

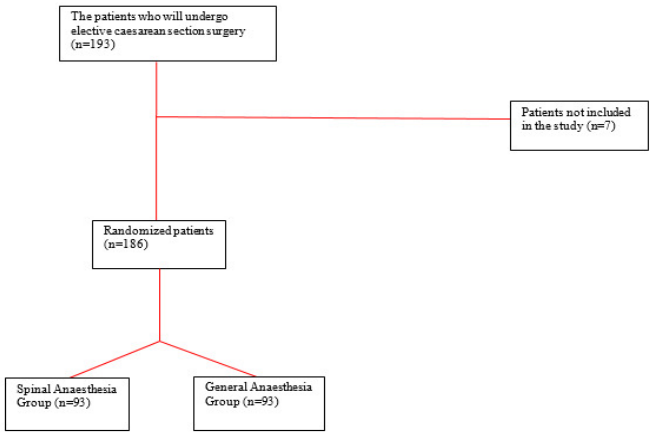

Figure 1: Patient flow diagram

There were no notable differences in anesthesia preferences between groups, regardless of mean BMI, age, or gestational age (p=0.208, p=0.966, p=0.374 respectively) (Table 1).

Table I: BMI, Age, and Gestational Week on Anesthesia Choice

	Anesthesia Choice	Mean ±SD	Median (Min-Max)	U-statistic	p-value
BMI	Spinal Anesthesia (n=93)	29.23 ±4.07	29.5 (17.7-37.4)	1026.00	0.208
	General Anesthesia (n=93)	30.82 ± 3.96	30.8 (21.2-42.9)		
Age	Spinal Anesthesia (n=93)	28.62 ± 5.33	28 (19-38)	1211.00	0.966
	General Anesthesia (n=93)	28.64 ± 5.80	29 (18-41)		
Gestational Week	Spinal Anesthesia (n=93)	38.28±0.96	38 (37-40)	1344.50	0.374
	General Anesthesia (n=93)	38.07±0.89	38 (37-41)		

*Data were given as Mean±SD and Median. Mann-Whitney u test was performed for analysis, BMI: Body Mass İndex SD= Standard Deviation Min: Minimum Max: Maximum. *p<0.05 indicates statistical significance.*

A significant difference in anesthesia preference was found between some educational levels of women. Statistically significant differences in anesthesia preference were found between university graduates and middle school graduates ($p < 0.001$ and $p = 0.004$ respectively) (Table 2). No significant discrepancies were observed between the other groups.

Table II: Female Education Level and Anesthesia Choice

Female Education	Spinal Anesthesia (n=93)	General Anesthesia (n=93)	p-value
University	30	5	<0.001*
High School	23	18	0.479
Middle School	12	29	0.004*
Primary School	21	25	0.610
Unable to read and write	7	16	0.072

*Analyzed using the Fisher's exact test *p<0.05 indicates statistical significance*

For men, there were significant differences in anesthesia preference between their educational level and their spouse's anesthesia preference. Statistically significant differences in anesthesia preference were found between university graduates and primary school graduates ($p < 0.001$ and $p = 0.019$ respectively) (Table 3). There were no notable differences between the other groups

Table III: Male Education Level and Anesthesia Choice

Male Education	Spinal Anesthesia (n=93)	General Anesthesia (n=93)	p-value
University	40	14	<0.001*
High School	26	25	0.999
Middle School	11	20	0.114
Primary School	13	27	0.019*
Unable to read and write	3	7	0.330

*Analyzed using the Fisher's exact test *p<0.05 indicates statistical significance*

Patient parity status had no statistically significant effect on anesthesia preference between groups ($p > 0.05$ for all) (Table 4).

Table IV: Parity and Anesthesia Choice

	Spinal Anesthesia (n=93)	General Anesthesia (n=93)	p-value
Multiparous	53	53	1.000
Primiparous	22	17	0.471
Nulliparous	18	23	0.479

*Analyzed using the Fisher's exact test *p<0.05 indicates statistical significance*

Anesthesia preference was not statistically affected by the presence of comorbidities (Hypertension, diabetes mellitus, thyroid disorders, asthma, and cardiovascular diseases) during pregnancy across the different groups. ($p= 0.694$) (Table 5).

Table V: Comorbidity and Anesthesia Choice

	Spinal Anesthesia (n=93)	General Anesthesia (n=93)	p-value
Comorbidity	17	14	0.694

*Analyzed using the Fisher's exact test *p<0.05 indicates statistical significance*

DISCUSSION

It was found that university-educated women and their university-educated partners were more likely to prefer spinal anesthesia for caesarean sections, whereas women with a middle school education and their partners with a primary school education were more likely to prefer general anesthesia. It was considered that those with higher educational attainment might better understand healthcare options and apply this awareness more effectively in their choices. The literature also shows similar results. Bukar et al.[7] found that the majority of individuals who preferred general anesthesia in Nigeria had lower levels of education. Previous research has suggested that higher educational attainment is associated with a higher preference for regional anesthesia[8]. Another study indicated that individuals with more advanced education and greater monthly earnings were more likely to prefer spinal anesthesia[9]. Moreover, a different study found that individuals who preferred spinal anesthesia tended to be older and more educated[10]. Conversely, not all studies align with these results; some have reported opposing evidence. Some studies have examined the anesthetic preferences of women with varying levels of education and concluded that the level of education did not substantially influence their choice of anesthesia[11]. According to a study by Ozmen et al.[1], education level had no effect on anesthesia preference, but individuals with higher education levels preferred spinal anesthesia more. A study evaluating anesthesia preferences of mothers undergoing caesarean section in Iran found no association between education level and choice of anesthesia[12]. Some studies have reported that education level has no significant effect on anesthesia choice. This difference may be due to the sociocultural characteristics of the population in which our study was conducted, changes in health literacy, or active

participation of spouses in the decision-making process. In our study, we found a strong association between the educational level of women and their spouses and the choice of anesthesia. This differs from previous studies, which have mostly examined only the woman's educational level. In this respect, our study contributes to the literature on the joint decision-making process of couples. For women without a degree, fear of needles was identified as the primary reason for refusing spinal anesthesia, while among those with a degree, fear of back pain was more prevalent. Additionally, at the academic level, concerns about vision and hearing loss, as well as spinal injury, were also significant factors[13]. Among the many factors that impact anesthesia preference, the fear of remaining conscious during surgery is one of the most significant .Many patients, due to insufficient knowledge about available anesthesia methods, tend to opt for general anesthesia[14]. A study by Jemal et al.[6] showed that the majority of pregnant women in developing countries lack sufficient information about types of anesthesia and therefore prefer general anesthesia. Our findings suggest that preoperative counseling should include more comprehensive information, particularly for patients with lower educational levels." In the study by Saygi et al.[15], there was no notable difference in BMI between the groups that chose general anesthesia and those that opted for spinal anesthesia. In the study by Sahintürk et al.[9], they found that patients under 20 years of age generally preferred general anesthesia, while those over 20 years of age preferred regional anesthesia methods. According to other research, age groups (≤25, 25–35, and ≥35 years) showed no statistically significant difference in their anesthesia preferences[16]. In a study exploring the relationship between gestational age and anesthesia selection, no effect was observed[15]. As seen in earlier studies, our findings did not reveal any significant relationship between body mass index, maternal age, gestational age, and the preferred anesthesia method.A study by Tor et al.[17], showed that multiparous women tended to prefer spinal anesthesia because they were familiar with this method and aware of its benefits. It is possible that their knowledge of spinal anesthesia and its benefits contributed to this preference. Another study found that parity and previous caesarean section had no significant effect on preference for anesthesia[7]. In our research, we observed no notable influence of parity on the choice of anesthesia.

The presence of comorbidities may influence anesthesia preference. Patients with chronic diseases may prefer regional anesthesia to avoid complications associated with general anesthesia and polypharmacy[18]. According to one study, chronic health conditions such as diabetes, hypertension, and heart disease were not associated with anesthesia preference for caesarean sections[19]. The proportion of patients with comorbidities who preferred spinal anesthesia was higher than those who opted for general anesthesia; however, this difference was not statistically significant. The single-center design of this study is a limitation. Multicenter studies conducted in different regions with groups of varying socioeconomic status could more clearly reveal the role of cultural factors in addition to educational level.

CONCLUSIONS

The study underscores that educational level is closely linked to anesthesia preferences in cesarean cases. Therefore, improving pre-anesthesia counseling could enable patients to take a more active role in making decisions about their care. The higher preference for spinal anesthesia among individuals with higher levels of education reflects the positive impact of appropriate education and information on anesthesia preferences. By strengthening the pre-anesthesia education process and ensuring patients are thoroughly informed, we can promote safer and more

effective decision-making when choosing anesthesia

Ethical approval: In line with the ethical principles of the Declaration of Helsinki, this study was structured as a prospective observational cohort. Ethical approval was received from University of Kafkas Non-interventional Ethics Committee (decision number: 418, date: 30.04.2024), and voluntary informed consent was collected from all subjects.

Conflict of Interest: The authors declared no conflicts of interest.

Financial Disclosure: The authors declared that this study has receivet no financial support.

REFERENCES

1. Ozmen H, Aydınlı B, Çitilcioğlu US, et al. Is there a relationship between the choice of anesthesia method and the education level of pregnant women in cesarean section. Lokman Hekim J. 2023;13:394–8.

2. Uluc K, Surhan Cinar A, Turk HS, et al. Comparison of the effects of anesthesia technique and maternal warming on neonatal body temperature in cesarean section operations: a retrospective study. Acta Med Nicomedia.2024;7:189–95.

3. Sung TY, Jee YS, You HJ, et al. Comparison of the effect of general and spinal anesthesia for elective cesarean section on maternal and fetal outcomes: a retrospective cohort study. Anesth Pain Med (Seoul). 2021;16:49–55.

4. Sak S, Peker N, Uyanıkoğlu H, et al. Which Should Be Performed; General or Spinal Anesthesia in Elective Cesarean Section. Zeynep Kamil Tıp Bül. 2018;49:44–8.

5. Çetin Akıcı Ö, Doğan Bakı E, Büyükerkmen E, et al. Evaluation of the satisfaction from general and spinal anesthesia in cesarean applied pregnant. Kocatepe Medical J. 2019;20(4):217–24.

6. Jemal B, Tesfaye M, Alemu M. Perception, Knowledge and Attitude of Developing Country Pregnant Mothers about Anesthesia for Cesarean Section. Univ J Med Sci. 2016;4:31–7.

7. Bukar M, Kwari DY, Moruppa JY, et al. Anaesthesia for caesarean delivery: choice of technique among antenatal attendees in north-eastern Nigeria. J Obstet Gynaecol. 2010;30:822–5.

8. Arslan B, Ozturk N, Onuk Z, et al. Factors affecting selection of anesthesia type in elective cesarean operations and pregnant preferences for anesthesia outcome. Med Sci. 2019;8:113-6.

9. Sahintürk H, Cakar S, Selvi O, et al. Factors affecting anaesthesia preferences of the gravid women who are to deliver by caesarean section. Sanamed. 2019;14:13–20.

10. Tawfeeq NA, Hilal F, Alharbi NM, et al. The Prevalence of Acceptance Between General Anesthesia and Spinal Anesthesia Among Pregnant Women Undergoing Elective Caesarean Sections in Saudi Arabia. Cureus. 2023;15: e44972.

11. Asghar K, Mehran L, Narges M. Social Determinants Of Anesthesia Choice For Cesarean Section In Mothers Attending Selected Primary Health Care Centers Of Tehran. Soc Determ Health. 2017;3:26-31.

12. Sadeghi A, Razavi SS, Gachkar L, et al. Evaluation of effective parameters for methods of anesthesia in caesarean section. J Iran Soc Anesthesiol Intens Care. 2008;2:52-7.

13. Emadi SA, Afshın GB, Ebrahim N, et al. Investigation of the pregnant women desire to choose the type of anesthesia during cesarean section in Imam Khomeini Hospital, Sari, Iran, in 2017. J Surg Trauma. 2021;9(2):79–88.

14. Karaaslan P, Aydin C, Aksu T. Factors Influencing the Preference of Regional Anaesthesia in the Obstetric Population: A Survey Study. Turk J Anaesthesiol Reanim. 2014;42:176.

15. Saygı Aİ, Özdamar Ö, Gün İ, et al. Comparison of maternal and fetal outcomes among patients undergoing cesarean section under general and spinal anesthesia: a randomized clinical trial. Sao Paulo Med J. 2015;133:227–34.

16. Ghaffari S, Dehghanpisheh L, Tavakkoli F, et al. The Effect of Spinal versus General Anesthesia on Quality of Life in Women Undergoing Cesarean Delivery on Maternal Request. Cureus. 2018;10:e3715.

17. Tör İH, Aksoy AN, Özkan H. The comparison of anesthesia technique preferences of primipar and multiparous patients undergoing elective cesarean section. J Gen Med. 2021;31:163-7.

18. Eyelade O, Sanusi A, Adigun T, et al. Outcome of anesthesia in elective surgical patients with comorbidities. Ann Afr Med. 2016;15:78.

19. Lai HY, Tsai PS, Fan YC, et al. Anesthetic practice for Caesarean section and factors influencing anesthesiologists' choice of anesthesia: a population-based study. Acta Anaesthesiol Scand. 2014;58:843–50.