





## Factors Associated with Gender Disparity on Editorial Boards of Anesthesiology Journals: A Cross-Sectional Study

 Mehmet Nuri Yakar,<sup>1</sup>  Duygu Bilge,<sup>2</sup>  Nurgazy Shermatov,<sup>2</sup>  Merve Oltulu,<sup>2</sup>  
 Volkan Hancı<sup>2</sup>

<sup>1</sup>Division of Intensive Care, Department of Anesthesiology and Reanimation, Şişli Hamidiye Etfal Training and Research Hospital, İstanbul, Türkiye

<sup>2</sup>Department of Anesthesiology and Reanimation, Dokuz Eylül University Faculty of Medicine, İzmir, Türkiye



The abstract of the study was presented as an oral presentation at the International Anaesthesiology and Reanimation Symposium on December 2–3, 2022, in Ankara, Türkiye.

### Cite this article as:

Yakar MN, Bilge D, Shermatov N, Oltulu M, Hancı V. Factors Associated with Gender Disparity on Editorial Boards of Anesthesiology Journals: A Cross-Sectional Study. J Clin Pract Res 2024;46(6):601–611.

### Address for correspondence:

Mehmet Nuri Yakar.  
Division of Intensive Care,  
Department of Anesthesiology  
and Reanimation, Şişli Hamidiye  
Etfal Training and Research  
Hospital, İstanbul, Türkiye  
**Phone:** +90 212 373 50 00  
**E-mail:** mnuriyakar@gmail.com

**Submitted:** 18.09.2024

**Revised:** 29.10.2024

**Accepted:** 06.11.2024

**Available Online:** 21.11.2024

Erciyes University Faculty of  
Medicine Publications -  
Available online at [www.jcprres.com](http://www.jcprres.com)

### ABSTRACT

**Objective:** The number of women in academic medicine has increased over recent decades. However, the representation of women in anesthesiology is a subject of ongoing discussion.

**Materials and Methods:** This prospective cross-sectional study aims to determine gender balance on editorial boards (EBs) of anesthesiology journals indexed in the Science Citation Index Expanded in the Web of Science. The gender of EB members and their titles were determined based on data obtained from the journal websites between March 10 and 25, 2024. Geographical characteristics of journals and publishers, journal metrics (including the 2022 impact factor, five-year impact factor, H-index, and publication count), journal quartiles, and categories were analyzed using Mann-Whitney U, chi-square, Fisher's exact tests, and Spearman's correlation coefficient. Logistic regression analysis was conducted to identify independent factors.

**Results:** Women comprised 24.4% of EB members and 5.0% in the role of editor-in-chief. The category of neurosciences (odds ratio [OR], 1.63; 95% confidence interval [CI], 1.15–2.29;  $p=0.006$ ) and employment as an associate editor (OR, 1.45; 95% CI, 1.09–1.92;  $p=0.011$ ) were independently associated with gender parity. Conversely, the role of editor-in-chief as a leadership position (OR, 0.17; 95% CI, 0.04–0.71;  $p=0.015$ ) and Japan as the publisher's country (OR, 0.12; 95% CI, 0.03–0.59;  $p=0.009$ ) were independently associated with gender disparity on EBs of anesthesiology journals.

**Conclusion:** To reduce gender disparity on the EBs of anesthesiology journals, further action is required. It is recommended that authorities in anesthesiology refine current policies through the implementation of objective measures.

**Keywords:** Anesthesiology, diversity, editorial policy, gender, gender disparities, parity.



This work is licensed under  
a Creative Commons  
Attribution-NonCommercial  
4.0 International License.

## INTRODUCTION

Over the past three decades, there has been a notable increase in the representation of women in various medical fields; however, the gender gap in academic medicine persists.<sup>1–3</sup> The gender disparity in anesthesiology has been frequently debated in the literature.<sup>1,2,4,5</sup> Nevertheless, the degree to which women contribute to academic publishing in anesthesiology and the extent of the gender gap on editorial boards (EBs) of anesthesiology journals have been the subject of a limited number of studies.<sup>6–8</sup> Further discussion on this topic is necessary.

In 2021, the World Economic Forum reported the global gender gap rate as 32%, projecting that it would take more than a century to close worldwide.<sup>9</sup> The proportion of female anesthesiologists in various countries ranges between 26% and 40%.<sup>4,6,10–12</sup> However, women occupy between 11% and 27% of leadership roles, such as department directors.<sup>2,4–6,13</sup> A study analyzing women's representation in the American Society of Anaesthesiologists revealed a lower representation rate in leadership roles compared to both the United States population and the general medical workforce in 2015.<sup>14</sup> A similar trend was observed in the American Board of Anaesthesiology, where women are underrepresented in positions such as diplomats, oral examiners, and directors.<sup>13</sup> Miller et al.<sup>11</sup> demonstrated that the proportions of female senior and first authors in anesthesiology research were 21.9% and 31.6%, respectively, reflecting improvement compared to the previous years. Nonetheless, the underrepresentation of women is also evident among grant recipients<sup>15</sup> and abstract presenters at annual anesthesiology society meetings.<sup>16</sup> The gender disparity in anesthesiology results from a complex interplay of factors. These factors include salary discrepancies between men and women, perceptions of gender bias in academic organizational structures, a lack of female role models in the field, and limited mentorship opportunities for women.<sup>17–19</sup> Additionally, challenges related to maternity, childbearing, parenting, and other family responsibilities, as well as the influence of colleagues and professional societies, may further exacerbate the issue.<sup>18</sup>

Previous studies have shown the underrepresentation of female academics in editor-in-chief (EiC) positions or on the EBs of several anesthesiology journals in recent years.<sup>1,2,6</sup> However, the characteristics of journals and publishers associated with this gender gap have not been clarified. In light of these factors, we conducted a gender analysis of EiCs and EB members of anesthesiology journals included in the Science Citation Index Expanded (SCIE) within the Web of Science (WoS). Furthermore, we examined the impact of adequate representation of women on the EBs of anesthesiology journals on publication metrics such as the impact factor (IF), H-index, and the number of publications in the WoS and PubMed databases.

## KEY MESSAGES

- Gender disparity in anesthesiology is a common phenomenon, similar to other fields of medicine.
- Women are underrepresented on editorial boards of anesthesiology journals, as well as on boards of anesthesiology societies, in roles as first or senior authors, among abstract presenters at meetings, in department chair positions, and as recipients of major awards and grants.
- To reduce gender disparity in anesthesiology, authorities are implementing policies that aim to improve current practices by using objective measures across all academic fields within anesthesiology.

## MATERIALS AND METHODS

### The Definition of the Term “Gender”

The term “gender” is used to describe an individual's social identities, rather than the biological “sex” assigned at birth. “Gender” is defined in a way that extends beyond its conventional scope, making it preferable for comparing men and women in gender-based medical research. This term has been used in the present study based on this broader definition.

### Ethical Considerations

The institutional ethics committee of Dokuz Eylül University approved this study on August 31, 2022 (IRB number: 2022/28–08). The study was conducted in accordance with the ethical standards set forth in the Declaration of Helsinki, 2013 edition.<sup>20</sup> The requirement for written informed consent was waived since the data were collected from publicly available sources on the internet.

### Study Design, Setting, and Participants

The primary objective of this cross-sectional study is to determine the current status of the gender gap on the EBs of anesthesiology journals. Secondary objectives are to assess the relationship between publication characteristics, journal metrics, and the representation of women on EBs, as well as to identify independent factors associated with gender parity on these boards.

In this study, we analyzed the gender balance among EiCs separately and alongside EB members of anesthesiology journals indexed in the SCIE within the WoS. Journals were identified through a search on the WoS platform (<https://mjla.clarivate.com/home>) using the term “anesthesiology” and then filtering the results for SCIE. Four researchers (MN, DB, NS, MO) screened the EBs. The gender of board members was

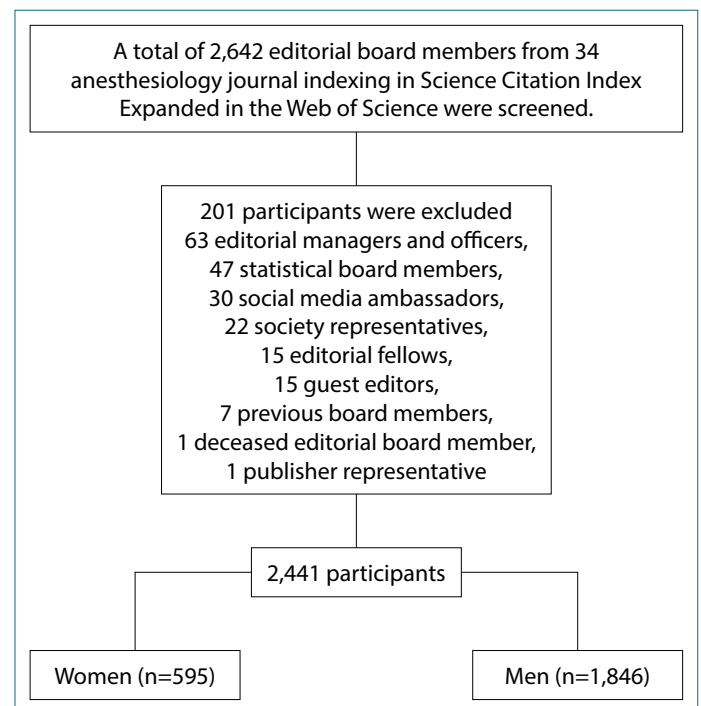
determined from photos or first names listed on the journals' websites between March 10 and 25, 2024. In cases where the gender of board members was unclear, it was clarified through online research using information from affiliated societies, hospitals, universities, and workplaces. Individuals with undefined genders, deceased or former board members, and those holding titles such as editorial manager, officer, statistical board member, social media ambassador, society representative, editorial fellow, guest editor, and publisher representative were excluded from the study. Emeritus board members and emeritus EiCs were also excluded from the screening process.

### Variables

The numbers and proportions of women in EiC positions and on EBs were determined. Editorial roles were classified as EiC, deputy EiC, editor, associate editor, section editor, EB member, and editorial advisor. The characteristics of journals, including publication attributes, catalog information, and impact metrics, were examined. The locations of both the journals and their publishers were also considered. Journal Citation Reports (JCR) is an annual report that analyzes journal metrics and is accessible on the WoS. In JCR, journals are categorized in one or more scientific fields based on content scope. Journals categorized solely in the field of anesthesiology were considered to have a unidisciplinary perspective, whereas those also listed in additional fields beyond anesthesiology were classified as multidisciplinary. Journal metrics, including IF, five-year IF, H-index, five-year H-index, and the number of publications on the WoS and PubMed, were assessed. In the WoS, journals are classified into four quartiles, from Q1 to Q4, based on publication metrics. The first quartile, Q1, includes journals in the top 25%, while the fourth quartile, Q4, includes those in the lowest 25%, in descending order. This study also recorded the quartile category of each journal for which editorial board members were employed. Finally, the publication duration of each journal was noted.

### Statistical Analysis

The statistical analysis was performed using the Statistical Package for the Social Sciences software (SPSS, version 24.0, IBM, Armonk, NY, US). Data distribution was assessed using the Shapiro-Wilk test. Data are presented as counts, percentages, and the median and interquartile range for categorical and continuous variables, respectively. Categorical variables were analyzed using Fisher's exact test or Chi-square tests, while continuous variables were evaluated using the Mann-Whitney U test. Spearman's correlation coefficient was used to examine the interrelations between gender distribution on EBs and journal properties and metrics. Independent variables associated with gender disparity on EBs were identified through multiple binary logistic regression



**Figure 1.** Flowchart of the study.

analysis. A model was constructed using the enter-method in stepwise regression analysis, specifically designed to incorporate variables linked to women's representation on EBs and statistically significant subsets of variables that could impact the results. For each independent factor, an odds ratio (OR), along with a 95% confidence interval (CI), was provided. In univariate analysis, the comparison of categorical or continuous variables associated with female or male representation was considered statistically significant if the two-tailed p-value was less than 0.05. Parameters statistically significant in favor of female representation were associated with gender parity, while those favoring male representation were considered to be associated with gender disparity. Furthermore, in multiple binary logistic analysis, an OR less than or greater than 1.00 with a p-value of less than 0.05 was identified as an independent factor, specifically indicating gender disparity or parity, respectively.

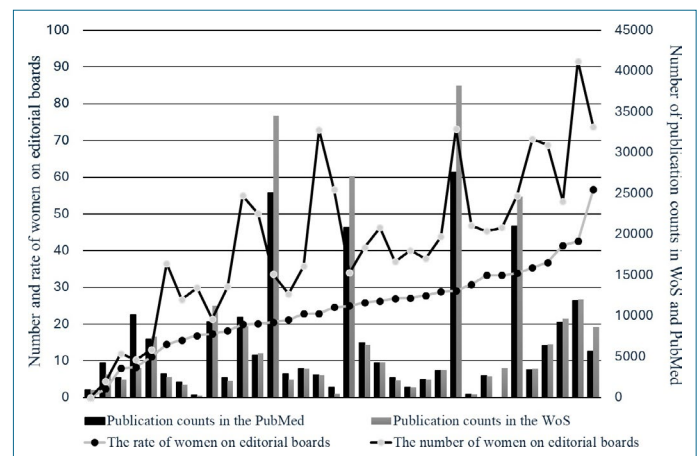
### RESULTS

A total of 34 anesthesiology journals were screened, and 2,642 participants were analyzed (Fig. 1). A total of 201 participants were excluded due to their roles on EBs, including individuals holding titles such as editorial director or officer, statistical board member, social media ambassador, society representative, editorial fellow, guest editor, former board member, publisher representative, and a deceased board member. In total, 595 women and 1,846 men were included in the study.

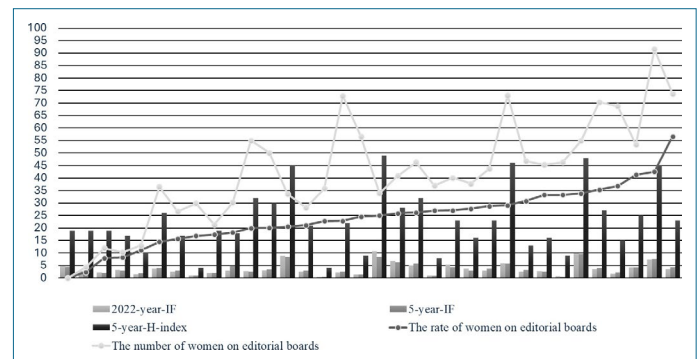
Journal metrics, catalog information, and publication characteristics are presented in Appendix 1. The majority of journals and publishers were based in the United States of America (USA) and the United Kingdom (UK). English was the predominant primary publication language. Three journals were multilingual. *Anaesthesia* and *Clinical Journal of Pain* had the highest 2022 IF (10.7) and H-index (133), respectively. Notably, *Anaesthesia* also held the highest five-year H-index (49), while the *British Journal of Anaesthesia* had the highest five-year IF (9.6). However, it should be noted that the five-year H-index was not calculated for six journals with more than 10,000 publications. *Anesthesia and Analgesia* had the highest number of publications in both the WoS (38,247) and PubMed (27,594), and had the earliest publication start date.

A total of 40 EiCs were identified on the official websites of the journals (Table 1). Among them, two EiCs (5% of all EiCs) were women, associated with the journals *Pain* and *Korean Journal of Anesthesiology*. The current EiC of the *Anesthesiologie Intensivmedizin Notfallmedizin Schmerztherapie* was not clearly identified on the journal's official website; therefore, data for the EiC of this journal were not included. A total of 595 women and 1,846 men held various EB positions. The *European Journal of Anaesthesiology* had the highest percentage of women on its EB, at 56.7%. This was followed by *Pain* and the *Canadian Journal of Anesthesia*, with women's representation rates of 42.6% and 41.4%, respectively. Notably, only one journal, *Best Practice & Research: Clinical Anaesthesiology*, had no women on its EB.

The univariate analysis of the factors—including positions on EBs, geographical aspects, and journal metrics—associated with women's representation is presented in Table 2. The proportion of women was significantly lower among EiCs, senior editors, and general EB members, and higher among associate editors. The United States as a publisher country, along with the United Kingdom and Canada as journal countries, was associated with gender parity. Conversely, Japan as both a publisher and journal country was associated with gender disparity. Similarly, journals and publishers from Asia exhibited a notable gender disparity, with significantly lower rates of women's representation (2.4% vs. 7.4%) compared to other continents. In contrast, publishers from America and journals from Europe were associated with gender parity. An analysis of journal metrics based on the gender distribution of EB members revealed a significant association between women's representation on EBs and higher 2022 IF, five-year IF, and H-index for the journals in question. This association was also observed in the number of publications listed on PubMed and the WoS. A comparative analysis of the category quartiles of journals employing women and men indicated that women were significantly more represented than men in Q1 journals, whereas men were significantly more represented than women in Q3 journals.



**Figure 2.** The relationship between women's representation on editorial boards and journal publication counts.



**Figure 3.** The relationship between women's representation on editorial boards and journal metrics.

The JCR categories of Neurosciences and Pediatrics were found to be significantly associated with gender parity (Table 3). Journals with a unidisciplinary perspective, categorized solely in Anesthesiology, were not associated with either gender parity or disparity, unlike journals with a multidisciplinary perspective.

The correlation analysis between journal metrics, publication characteristics, and the gender composition of EBs is presented in Table 4. The analysis revealed a positive, low correlation between the total number of women on EBs and the five-year H-index of the journals ( $r=0.380$ ,  $p=0.027$ ). However, no statistically significant correlations were found between the total number and proportion of women on EBs and various journal metrics, including the 2022 IF, five-year IF, H-index, and the number of publications on PubMed and the WoS. These relationships are depicted in Figures 2 and 3.

**Table 1.** Gender distribution of editors-in-chief and editorial board members

| Journal   | Editorial board* |                  | Editors-in-chief* |                |               |
|---|------------------|------------------|-------------------|----------------|---------------|
|   | Women<br>(n=595) | Men<br>(n=1,846) | All<br>(n=40)     | Women<br>(n=2) | Men<br>(n=38) |
| <i>Acta Anaesthesiologica Scandinavica</i>                            | 4 (17.4)         | 19 (82.6)        | 1                 | 0              | 1             |
| <i>Anaesthesia</i>  | 9 (25.0)         | 27 (75.0)        | 1                 | 0              | 1             |
| <i>Anaesthesia and Intensive Care</i>                                 | 2 (11.1)         | 16 (88.9)        | 1                 | 0              | 1             |
| <i>Anaesthesia Critical Care &amp; Pain Medicine</i>                  | 13 (27.1)        | 35 (72.9)        | 1                 | 0              | 1             |
| <i>Anaesthesiologie/Die Anaesthesiologie</i>                          | 13 (16.9)        | 64 (83.1)        | 2                 | 0              | 2             |
| <i>Anästhesiologie &amp; Intensivmedizin</i>                          | 13 (33.3)        | 26 (66.7)        | 1                 | 0              | 1             |
| <i>Anesthesiologie Intensivmedizin Notfallmedizin Schmerztherapie</i> | 13 (22.8)        | 44 (77.2)        | 0                 | 0              | 0             |
| <i>Anesthesia and Analgesia</i>                                       | 44 (29.1)        | 107 (70.9)       | 1                 | 0              | 1             |
| <i>Anesthesiology</i>   | 13 (20.6)        | 50 (79.4)        | 1                 | 0              | 1             |
| <i>Best Practice &amp; Research-Clinical Anaesthesiology</i>          | 0 (0.0)          | 8 (100.0)        | 1                 | 0              | 1             |
| <i>BMC Anesthesiology</i>   | 20 (22.9)        | 168 (77.1)       | 1                 | 0              | 1             |
| <i>Brazilian Journal of Anesthesiology</i>                            | 32 (24.6)        | 98 (75.4)        | 2                 | 0              | 2             |
| <i>British Journal of Anaesthesia</i>                                 | 21 (33.9)        | 41 (66.1)        | 2                 | 0              | 2             |
| <i>Canadian Journal of Anesthesia</i>                                 | 12 (41.4)        | 17 (58.6)        | 1                 | 0              | 1             |
| <i>Clinical Journal of Pain</i>                                       | 15 (28.8)        | 37 (71.2)        | 1                 | 0              | 1             |
| <i>Current Opinion in Anesthesiology</i>                              | 7 (21.2)         | 26 (78.8)        | 2                 | 0              | 2             |
| <i>European Journal of Anaesthesiology</i>                            | 17 (56.7)        | 13 (43.3)        | 1                 | 0              | 1             |
| <i>European Journal of Pain</i>                                       | 35 (35.4)        | 64 (64.6)        | 1                 | 0              | 1             |
| <i>International Journal of Obstetric Anesthesia</i>                  | 12 (33.3)        | 24 (66.7)        | 1                 | 0              | 1             |
| <i>Journal of Anesthesia</i>  | 2 (2.4)          | 83 (97.6)        | 1                 | 0              | 1             |
| <i>Journal of Cardiothoracic and Vascular Anesthesia</i>              | 35 (20.0)        | 140 (80.0)       | 1                 | 0              | 1             |
| <i>Journal of Clinical Anesthesia</i>                                 | 15 (25.9)        | 43 (74.1)        | 1                 | 0              | 1             |
| <i>Journal of Clinical Monitoring and Computing</i>                   | 4 (8.0)          | 46 (92.0)        | 1                 | 0              | 1             |
| <i>Journal of Neurosurgical Anesthesiology</i>                        | 10 (27.8)        | 26 (72.2)        | 1                 | 0              | 1             |
| <i>Korean Journal of Anesthesiology</i>                               | 12 (18.2)        | 54 (81.8)        | 2                 | 1              | 1             |
| <i>Minerva Anestesiologica</i>  | 2 (8.3)          | 22 (91.7)        | 1                 | 0              | 1             |
| <i>Pain</i>   | 49 (42.6)        | 66 (57.4)        | 1                 | 1              | 0             |
| <i>Pain Medicine</i>  | 30 (20.1)        | 119 (79.9)       | 1                 | 0              | 1             |
| <i>Pain Physician</i>   | 22 (14.5)        | 130 (85.5)       | 1                 | 0              | 1             |
| <i>Pain Practice</i>  | 11 (15.7)        | 59 (84.3)        | 1                 | 0              | 1             |
| <i>Pediatric Anesthesia</i>   | 32 (36.8)        | 55 (63.2)        | 1                 | 0              | 1             |
| <i>Perioperative Medicine</i>   | 16 (30.8)        | 36 (69.2)        | 2                 | 0              | 2             |
| <i>Regional Anesthesia and Pain Medicine</i>                          | 20 (26.3)        | 56 (73.7)        | 1                 | 0              | 1             |
| <i>Schmerz</i>  | 10 (27.0)        | 27 (73.0)        | 2                 | 0              | 2             |

All values are expressed as numbers and percentages. \*: Data were collected between March 10 and March 25, 2024.

**Table 2.** Factors associated with the gender distribution of editorial board members

| Journal metrics and publication properties | Gender distribution |                  |                  | p                |
|--|---------------------|------------------|------------------|------------------|
|  | All<br>(n=2,441)    | Women<br>(n=595) | Men<br>(n=1,846) |                  |
| Role of editor*                            |                     |                  |                  |                  |
| Editor-in-chief                            | 40 (1.6)            | 2 (0.3)          | 38 (2.1)         | <b>0.002</b>     |
| Deputy editor-in-chief                     | 31 (1.3)            | 6 (1.0)          | 25 (1.4)         | 0.674            |
| Section editor                             | 292 (12.0)          | 60 (10.1)        | 232 (12.6)       | 0.110            |
| Senior editor                              | 36 (1.5)            | 3 (0.5)          | 33 (1.8)         | <b>0.029</b>     |
| Editor                                     | 300 (12.3)          | 75 (12.6)        | 225 (12.2)       | 0.774            |
| Associate editor                           | 448 (18.4)          | 155 (26.1)       | 293 (15.9)       | <b>&lt;0.001</b> |
| Editorial board member                     | 1,051 (43.1)        | 228 (38.3)       | 823 (44.6)       | <b>0.008</b>     |
| Editorial advisor                          | 243 (10.0)          | 66 (11.1)        | 177 (9.6)        | 0.306            |
| Publisher's country                        |                     |                  |                  |                  |
| United States                              | 1,339 (54.9)        | 362 (60.8)       | 977 (52.9)       | <b>0.001</b>     |
| United Kingdom                             | 611 (25.0)          | 151 (25.4)       | 460 (24.9)       | 0.828            |
| Germany                                    | 260 (10.7)          | 53 (8.9)         | 207 (11.2)       | 0.126            |
| South Korea                                | 66 (2.7)            | 12 (2.0)         | 54 (2.9)         | 0.308            |
| France                                     | 48 (2.0)            | 13 (2.2)         | 35 (1.9)         | 0.615            |
| Japan                                      | 85 (3.5)            | 2 (0.3)          | 83 (4.5)         | <b>&lt;0.001</b> |
| Italy                                      | 24 (1.0)            | 2 (0.3)          | 22 (1.2)         | 0.091            |
| Netherlands                                | 8 (0.3)             | 0 (0.0)          | 8 (0.4)          | 0.212            |
| Journal's Country                          |                     |                  |                  |                  |
| United States                              | 1,054 (43.2)        | 251 (42.2)       | 803 (43.5)       | 0.601            |
| United Kingdom                             | 704 (28.8)          | 212 (35.6)       | 492 (26.7)       | <b>&lt;0.001</b> |
| Brazil                                     | 130 (5.3)           | 32 (5.4)         | 98 (5.3)         | 0.917            |
| Germany                                    | 260 (10.7)          | 53 (8.9)         | 207 (11.2)       | 0.126            |
| South Korea                                | 66 (2.7)            | 12 (2.0)         | 54 (2.9)         | 0.308            |
| France                                     | 48 (2.0)            | 13 (2.2)         | 35 (1.9)         | 0.615            |
| Canada                                     | 29 (1.2)            | 12 (2.0)         | 17 (0.9)         | <b>0.047</b>     |
| Japan                                      | 85 (3.5)            | 2 (0.3)          | 83 (4.5)         | <b>&lt;0.001</b> |
| Denmark                                    | 23 (0.9)            | 4 (0.7)          | 19 (1.0)         | 0.626            |
| Italy                                      | 24 (1.0)            | 2 (0.3)          | 22 (1.2)         | 0.091            |
| Australia                                  | 18 (0.7)            | 2 (0.3)          | 16 (0.9)         | 0.272            |
| Publisher's continent                      |                     |                  |                  |                  |
| America                                    | 1,339 (54.9)        | 362 (60.8)       | 977 (52.9)       | <b>0.001</b>     |
| Europe                                     | 951 (39.0)          | 219 (36.8)       | 732 (39.7)       | 0.227            |
| Asia                                       | 151 (6.2)           | 14 (2.4)         | 137 (7.4)        | <b>&lt;0.001</b> |
| Journal's continent                        |                     |                  |                  |                  |
| America                                    | 1,213 (49.7)        | 295 (49.6)       | 918 (49.7)       | 0.962            |
| Europe                                     | 1,059 (43.4)        | 284 (47.7)       | 775 (42.0)       | <b>0.015</b>     |

**Table 2 (cont).** Factors associated with the gender distribution of editorial board members

| Journal metrics and publication properties | Gender distribution |                     |                     | p      |
|--|---------------------|---------------------|---------------------|--------|
|  | All<br>(n=2,441)    | Women<br>(n=595)    | Men<br>(n=1,846)    |        |
| Asia                                       | 151 (6.2)           | 14 (2.4)            | 137 (7.4)           | <0.001 |
| Australia                                  | 18 (0.7)            | 2 (0.3)             | 16 (0.9)            | 0.272  |
| Primary language                           |                     |                     |                     |        |
| English                                    | 2,207 (90.4)        | 544 (91.4)          | 1,663 (90.1)        | 0.378  |
| Multilingual                               | 120 (4.9)           | 28 (4.7)            | 92 (5.0)            | 0.828  |
| German                                     | 114 (4.7)           | 23 (3.9)            | 91 (4.9)            | 0.316  |
| Impact Factor (2022)                       | 2.9 (2.2–4.8)       | 3.1 (2.2–5.9)       | 2.8 (2.2–3.7)       | 0.004  |
| 5-year Impact Factor                       | 3.2 (2.5–4.8)       | 3.4 (2.5–5.7)       | 2.9 (2.5–4.5)       | <0.001 |
| H-index                                    | 65 (44–95)          | 77 (44–95)          | 62 (45–95)          | 0.159  |
| 5-year H-index                             | 23 (17–32)          | 25 (16–32)          | 23 (17–32)          | 0.012  |
| Publication count                          |                     |                     |                     |        |
| Web of Science                             | 3,538 (2,491–8,742) | 4,369 (2,491–9,683) | 3,515 (2,211–8,742) | <0.001 |
| PubMed                                     | 3,555 (2,693–9,833) | 4,279 (2,832–9,833) | 3,555 (9,322–2,693) | 0.002  |
| Publication duration, years                | 37 (27–49)          | 37 (27–56)          | 37 (27–49)          | 0.265  |
| Category quartile                          |                     |                     |                     |        |
| Q1   | 609 (24.9)          | 184 (30.9)          | 425 (23.0)          | <0.001 |
| Q2   | 645 (26.4)          | 155 (26.1)          | 490 (25.6)          | 0.831  |
| Q3   | 719 (29.5)          | 137 (23.0)          | 582 (31.5)          | <0.001 |
| Q4   | 468 (19.2)          | 119 (20.0)          | 349 (18.9)          | 0.550  |

All values are expressed as numbers (percentages) or medians (interquartile range). Categorical variables were analyzed using Fisher's exact or chi-square tests, while continuous variables were analyzed using the Mann-Whitney U test. Statistically significant parameters favoring female representation were considered to indicate gender parity, whereas the opposite was deemed to represent gender disparity. JCR: Journal Citation Report; \*: Data collected between March 10 and March 25, 2024.

The factors related to gender parity are presented in Table 5. Multiple binary logistic regression analysis indicated that the neurosciences category in JCR (OR, 1.63; 95% CI, 1.15–2.29;  $p=0.006$ ) and employment as an associate editor (OR, 1.45; 95% CI, 1.09–1.92;  $p=0.011$ ) were independently associated with fair representation of women on EBs of anesthesiology journals. Conversely, employment as an EiC (OR, 0.17; 95% CI, 0.04–0.71;  $p=0.015$ ) and Japan as a publisher's country (OR, 0.12; 95% CI, 0.03–0.59;  $p=0.009$ ) were independently associated with a gender gap on EBs of journals in the field of anesthesiology.

## DISCUSSION

This study examines the gender distribution among EBs and EiCs of anesthesiology journals indexed in the SCIE within the WoS. The results indicated an underrepresentation of women in EiC positions and on EBs, with representation rates of 5.0% and 24.4%, respectively. The JCR category in WoS for neurosciences and the role of associate editor were associated with an

increased representation of women. Conversely, Japan as a publisher country and the role of EiC were found to significantly contribute to the gender gap on EBs of anesthesiology journals. This study represents the first attempt to analyze the gender composition of EBs of leading anesthesiology journals and to identify factors independently associated with differences in publication characteristics between genders.

The gender composition of EBs in different fields has been the subject of previous studies. McMullen et al.<sup>6</sup> conducted a comprehensive analysis of the top 19 anesthesiology journals indexed in the Scimago database. Their findings revealed a striking underrepresentation of women in both EiC roles and on EBs in 2020. The average representation of women in these roles was 0% for EiCs and 18% for EBs. In the present study, the representation of only two women in EiC roles is notable, as is the underrepresentation of women on EBs. Female anesthesiologists are also underrepresented

**Table 3.** Web of Science Journal Citation Reports category of the journals

| Journal category and disciplinary focus | Gender distribution |                  |                  | p      |
|---|---------------------|------------------|------------------|--------|
|   | All<br>(n=2,441)    | Women<br>(n=595) | Men<br>(n=1,846) |        |
| Journal citation reports category       |                     |                  |                  |        |
| Anesthesiology (only)                   | 1,195 (49.0)        | 275 (46.2)       | 920 (49.8)       | 0.125  |
| Clinical neurology                      | 561 (23.0)          | 152 (25.5)       | 409 (22.2)       | 0.087  |
| Neurosciences                           | 214 (8.8)           | 84 (14.1)        | 130 (7.0)        | <0.001 |
| Critical care medicine                  | 186 (7.6)           | 43 (7.2)         | 143 (7.7)        | 0.678  |
| Cardiac & cardiovascular systems        | 175 (7.2)           | 35 (5.9)         | 140 (7.6)        | 0.162  |
| Peripheral vascular disease             | 175 (7.2)           | 35 (5.9)         | 140 (7.6)        | 0.162  |
| Respiratory system                      | 175 (7.2)           | 35 (5.9)         | 140 (7.6)        | 0.162  |
| Medicine, general & internal            | 149 (6.1)           | 30 (5.0)         | 119 (6.4)        | 0.213  |
| Surgery                                 | 88 (3.6)            | 26 (4.4)         | 62 (3.4)         | 0.250  |
| Pediatrics                              | 87 (3.6)            | 32 (5.4)         | 55 (3.0)         | 0.006  |
| Obstetrics & gynecology                 | 36 (1.5)            | 12 (2.0)         | 24 (1.3)         | 0.207  |
| Disciplinary of the editorial Board     |                     |                  |                  |        |
| Multidisciplinary                       | 1,246 (51.0)        | 320 (53.8)       | 926 (50.2)       | 0.125  |

All values are expressed as numbers (percentages). Categorical variables were analyzed using Fisher's exact or chi-square tests. Statistically significant parameters favoring female representation were considered to indicate gender parity, whereas opposite was deemed to represent gender disparity.

**Table 4.** Correlations between gender distribution of editorial board members and journal publication properties and metrics

| Factors related to journal metrics        | IF     | IF       | H-index      | Publication | First            | Publication count |        |
|---|--------|----------|--------------|-------------|------------------|-------------------|--------|
|   | (2021) | (5-year) | (5-year)     | duration    | publication year | PubMed            | WoS    |
| Total number of editorial board members   |        |          |              |             |                  |                   |        |
| r   | 0.032  | 0.066    | 0.282        | -0.146      | 0.146            | 0.042             | 0.029  |
| p   | 0.86   | 0.71     | 0.11         | 0.41        | 0.41             | 0.82              | 0.87   |
| Total number of men on editorial boards   |        |          |              |             |                  |                   |        |
| r   | -0.001 | 0.019    | 0.265        | -0.109      | 0.109            | 0.010             | -0.020 |
| p   | 0.99   | 0.91     | 0.13         | 0.54        | 0.54             | 0.96              | 0.91   |
| Total number of women on editorial boards |        |          |              |             |                  |                   |        |
| r   | 0.162  | 0.224    | <b>0.380</b> | -0.165      | 0.165            | 0.178             | 0.241  |
| p   | 0.36   | 0.20     | <b>0.027</b> | 0.35        | 0.35             | 0.32              | 0.17   |
| Rate of women on editorial boards         |        |          |              |             |                  |                   |        |
| r   | 0.231  | 0.267    | 0.200        | -0.086      | 0.086            | 0.207             | 0.325  |
| p   | 0.19   | 0.13     | 0.26         | 0.63        | 0.63             | 0.25              | 0.06   |
| Rate of women on editorial boards >24.4%  |        |          |              |             |                  |                   |        |
| r   | 0.304  | 0.286    | 0.156        | -0.003      | 0.003            | 0.089             | 0.180  |
| p   | 0.08   | 0.10     | 0.38         | 0.99        | 0.99             | 0.62              | 0.31   |

IF: Impact factor; WoS: Web of Science; r: Spearman's correlation coefficient.



**Table 5.** Independent factors associated with gender parity on editorial boards

| Factors related to gender diversity | OR (95% CI)      | p            |
|-------------------------------------|------------------|--------------|
| JCR category in WoS                 |                  |              |
| Neurosciences                       | 1.63 (1.15–2.29) | <b>0.006</b> |
| Pediatrics                          | 1.36 (0.79–2.34) | 0.27         |
| Position on editorial board         |                  |              |
| Associate editor                    | 1.45 (1.09–1.92) | <b>0.011</b> |
| Editor-in-chief                     | 0.17 (0.04–0.71) | <b>0.015</b> |
| Publisher country                   |                  |              |
| Japan                               | 0.12 (0.03–0.59) | <b>0.009</b> |
| US                                  | 1.18 (0.88–1.59) | 0.27         |
| Journal continent                   |                  |              |
| Europe                              | 1.30 (0.97–1.73) | 0.08         |
| Asia                                | 0.86 (0.40–1.83) | 0.69         |
| Publication metrics                 |                  |              |
| 5-year IF                           | 0.94 (0.84–1.06) | 0.30         |
| 5-year H-index                      | 1.01 (0.99–1.03) | 0.38         |
| Category quartile                   |                  |              |
| Q1                                  | 1.03 (0.66–1.60) | 0.90         |

An odds ratio less than or greater than 1.00, with a p-value below 0.05, was identified as an independent factor indicating gender disparity and parity, respectively. OR: Odds ratio; JCR: Journal citation reports; WoS: Web of Science; US: United States; IF: Impact factor.

in other leadership positions, such as senior editor. This underrepresentation extends to department chairs,<sup>2,4–6,13</sup> grant award recipients,<sup>13</sup> full professor positions,<sup>2</sup> and other leadership roles within anesthesiology societies and organizations.<sup>13,14</sup> A similar analysis was conducted on critical care medicine journals, a subspecialty of anesthesiology. The results indicated that critical care journals indexed in the SCIE exhibited an underrepresentation of women in EiC positions and on EBs.<sup>21</sup> The present study found that anesthesiology journals are more likely to include female academics in lower-level positions, such as associate editor, rather than in EiC or senior editor positions. However, Atiş et al.<sup>22</sup> presented a comparison of emergency medicine journals with the top 10 anesthesiology journals indexed in Scimago. Their findings indicated that the overall representation of women in EiC positions and on EBs in anesthesiology journals was higher than in emergency medicine journals (26.9% vs. 19.4%). Furthermore, the study revealed a more equitable representation of women on EBs of anesthesiology journals compared to the top 10 medical journals in neurology, pulmonology, surgery, hepatology, and five other specialties. While gender parity on EBs of anesthesiology journals appears

more balanced compared to several medical specialties, the gender gap in anesthesiology journals is still substantial and requires urgent attention.

The representation of women in anesthesiology varies by region. In the United States, the rates of women in academic anesthesiology (26%) and anesthesiology residency programs (33%) are lower than the overall physician rate (36%).<sup>23</sup> In Europe, the median rate of female anesthesiology residents is 60%, with the highest rates observed in Montenegro (87%) and Bosnia and Herzegovina (78%).<sup>24</sup> In 2016, only 32% of anesthesiologists in Canada were women.<sup>24</sup> As of 2018, the percentage of female medical doctors practicing in Japan remained below the average for countries in the other Organization for Economic Co-operation and Development, at just 21.8%. Similarly, a study of over 300 medical journals published by Japanese associations found that only 1.7% (n=6) of EiCs were women.<sup>25</sup> In the present study, Japan as both a journal and publisher country exhibited gender disparity in the composition of EBs in anesthesiology. It is conceivable that obstacles to women's representation in anesthesiology across various regions may have cultural origins that influence the academic landscape. However, regional differences alone are insufficient to explain the pervasive gender imbalance in anesthesiology on a global scale.

Gender disparity in anesthesiology is also evident in authorship order in publications, with women underrepresented as first or senior authors in anesthesiology journals.<sup>10,11</sup> A study of 1,404 academic anesthesiologists in Canada revealed that male anesthesiologists had higher citation counts, publication numbers, and H-index scores than women.<sup>4</sup> An analysis of critical care literature further demonstrated that journals with a more equitable distribution of women on their editorial boards exhibited significantly higher five-year IF and a greater publication volume within the WoS database.<sup>21</sup> Additionally, this study showed a positive correlation between the number of women on EBs and the number of publications indexed in PubMed and WoS. The findings of the present study align with those of the aforementioned research. This study demonstrates that women's representation on the EBs of anesthesiology journals correlates with quality indicators, including higher 2022 IF, five-year IFs, and five-year H-index scores, compared to anesthesiology journals where female representation is lower. However, this study did not identify a statistically significant correlation between the proportion of women on EBs and publication counts. Additionally, the contributions of women to academic publishing are evident in another quality indicator—the categorization of journals—where women's presence is reflected in the quartile rankings. This study demonstrated that the proportion of women on EBs of anesthesiology journals in the Q1 quartile was significantly

high. In conclusion, anesthesiology journals should aim for equitable representation of female editors on their EBs, which could enhance publication metrics and overall quality, as reflected in IF, five-year IF, five-year H-index, top-quartile rankings, and publication counts in WoS and PubMed.

The relationship between the JCR category of journals and women's representation in academic publishing has yet to be extensively explored. A previous study demonstrated that journals focusing on obstetric or pediatric anesthesia significantly increase the rate of senior female authors, while those publishing in critical care increase the rate of female first authors.<sup>11</sup> Another study, which included critical care journals, showed that adding the nursing or respiratory system categories to the critical care medicine category in JCR improved women's representation on EBs of critical care journals.<sup>21</sup> In the present study, anesthesiology journals categorized under neurosciences or pediatrics in the JCR showed improved representation of women. However, the editorial focus—whether unidisciplinary or multidisciplinary—had no impact on gender parity on the EBs of anesthesiology journals.

Although the projected timeline to close the global gender gap is long,<sup>9</sup> developments over the last decade offer hope for reducing gender disparity in medicine. Many anesthesiology societies have announced diversity, equity, and inclusion policies,<sup>26–29</sup> and some have established gender equity committees working toward gender parity in anesthesiology.<sup>30</sup> In Australia, the National Health and Medical Research Council has committed to awarding half of investigator grants to women and non-binary applicants.<sup>31</sup> The National Institutes of Health in the United States also offers diversity-related funding opportunities.<sup>32</sup> Despite these efforts, there is still a need to expand diversity policies across all fields, including in conferences, journals, leadership roles within professional societies, and academic and administrative ranks in anesthesiology.

### Limitations

This study has several limitations. The data presented were collected online, and only journals indexed in the SCIE Core Collection on the WoS were included in the study. Anesthesiology journals indexed in other databases were not evaluated. Although this study highlighted the low proportion of women on the EBs of anesthesiology journals, the inclusion of only journals indexed in the SCIE may restrict the applicability of findings to all anesthesiology journals. Additionally, the employment status of participants at academic or non-academic hospitals, which could significantly influence the fair representation of women, was not evaluated. This study only analyzed the relationship between gender disparity and certain journal and publisher characteristics, while gender parity is influenced by many factors beyond these parameters.

### CONCLUSION

This study identified publisher characteristics and journal metrics that influence gender parity on the EBs of anesthesiology journals indexed in the SCIE Core Collection on the WoS. The results reveal a significant gender gap on the EBs of anesthesiology journals, particularly in leadership roles such as EiC or senior editor. However, a higher representation of women on EBs was associated with an increased number of publications on PubMed or WoS and higher journal metrics, such as IFs for both the 2022-year and five-year metrics, as well as the five-year H-index. Therefore, it is essential that new policies target various aspects contributing to gender disparity. It is recommended that policies focus on providing support for women academics during pregnancy, breastfeeding and parenthood; creating opportunities for productivity throughout all stages of academic life; offering optimal mentorship; and ensuring fair representation across all academic ranks. Furthermore, to assess the effectiveness of these policies and to allocate resources to areas of greatest need, it is recommended that relevant authorities conduct periodic analyses using objective measures of gender disparity across all fields of anesthesiology.

**Ethics Committee Approval:** The Dokuz Eylül University Non-Interventional Ethics Committee granted approval for this study (date: 31.08.2022, number: 2022/28–08).

**Author Contributions:** Concept – MNY, VH, DB; Design – MNY, VH, NS; Supervision – MNY, VH, MO; Data Collection and/or Processing – MNY, DB, NS, MO; Analysis and/or Interpretation – MNY, VH; Literature Search – MNY, DB, NS, MO; Writing – MNY, VH; Critical Reviews – MNY, DB, NS, MO, VH.

**Conflict of Interest:** The authors have no conflict of interest to declare.

**Use of AI for Writing Assistance:** Not declared.

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

**Peer-review:** Externally peer-reviewed.

### REFERENCES

1. Wong CA, Stock MC. The status of women in academic anesthesiology: a progress report. *Anesth Analg* 2008; 107(1): 178-84.
2. Bissing MA, Lange EMS, Davila WF, Wong CA, McCarthy RJ, Stock MC, et al. Status of women in academic anesthesiology: a 10-year update. *Anesth Analg* 2019; 128(1): 137-43.
3. Jefferson L, Bloor K, Maynard A. Women in medicine: historical perspectives and recent trends. *Br Med Bull* 2015; 114(1): 5-15.
4. Esslinger EN, Van der Westhuizen M, Jalal S, Masud S, Khosa F. Gender-based disparity in academic ranking and research

- productivity among Canadian Anesthesiology Faculty. *Cureus* 2020; 12(11): e11443.
5. Marroquin BM. Wake up to the gender gap in academic anesthesiology and address the pipeline. *Proc (Bayl Univ Med Cent)* 2023; 36(1): 135-7.
  6. McMullen K, Kraus MB, Kosiorek H, Harbell MW. Representation of women as editors in anesthesiology journals. *Anesth Analg* 2022; 134(5): 956-63.
  7. Dunn LK, Wong CA. Enough Talk, the Time Is Now for Gender Parity of Anesthesiology Journals' Editorial Boards. *Anesth Analg* 2022; 134(5): 952-5.
  8. De Cassai A, Spolverato G. Being an Editor-in-Chief in Anesthesia: Apparently Not a Woman's Job. *Anesth Analg* 2022; 135(4): e21-e22.
  9. World Economic Forum. Global Gender Gap Report 2021. [https://www3.weforum.org/docs/WEF\\_GGGR\\_2021.pdf](https://www3.weforum.org/docs/WEF_GGGR_2021.pdf) Accessed Oct 5, 2022.
  10. Kinoshita M, Takahashi M, Tanaka K, Sakai Y. Authorship by gender in anesthesiology journals: a retrospective cross-sectional study for Japan. *J Anesth* 2023; 37(3): 364-70.
  11. Miller J, Chuba E, Deiner S, DeMaria Jr S, Katz D. Trends in authorship in anesthesiology journals. *Anesth Analg* 2019; 129(1): 306-10.
  12. Brooks AK, Liang Y, Brooks M, Lee JW, Zhang X, Nwangwu I, et al. Leadership roles and initiatives for diversity and inclusion in academic anesthesiology departments. *J Natl Med Assoc* 2022; 114(2): 147-55.
  13. Fahy BG, Culley DJ, Sun H, Dainer R, Lutkoski BP, Lien CA. Gender distribution of the American Board of Anesthesiology diplomates, examiners, and directors (1985-2015). *Anesth Analg* 2018; 127(2): 564-8.
  14. Toledo P, Duce L, Adams J, Ross VH, Thompson KM, Wong CA. Diversity in the American Society of Anesthesiologists leadership. *Anesth Analg* 2017; 124(5): 1611-6.
  15. Toor AS, Wooding DJ, Masud S, Khosa F. Gender distribution in awarded Canadian Institutes of Health Research grants among anesthesiologists: a retrospective analysis between 2008 and 2020. *Can J Anaesth* 2021; 68(10): 1580-1.
  16. Pan S, Shillcutt S, Oakes D, Muehlschegel JD, Shore-Lesserson L, Rong LQ. Gender of Abstract Presenters at the Annual Meetings of the Society of Cardiovascular Anesthesiologists and American Society of Anesthesiologists: 2016 to 2020. *J Cardiothorac Vasc Anesth* 2022; 36(7): 1867-72.
  17. Lorello GR, Tulin C. Women anesthesiologists' journeys to academic leadership: a constructivist grounded theory-inspired study. *Can J Anaesth* 2020; 67(9): 1130-9.
  18. Ngai J, Capdeville M, Sumler M, Oakes D. A call for diversity: women and cardiothoracic anesthesiology fellowship education. *J Cardiothorac Vasc Anesth* 2022; 36(1): 66-75.
  19. Shillcutt S, Peterson-Layne C. More than the money: work culture challenges for women anesthesiologists. *Int Anesthesiol Clin* 2018; 56(3): 44-58.
  20. Association WM. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA* 2013; 310(20): 2191-4.
  21. Yakar MN, Köşker RK, İbişoğlu E, Kara F, Hancı V. Gender distribution of editorial board members in critical care journals: Assessment of gender parity. *J Crit Care* 2023; 75: 154288.
  22. Atiş ŞE, Bozan Ö, Bildik B, Çekmen B, Mistik Y. Gender disparity in medicine and where are we now in emergency medicine? *Am J Emerg Med* 2022; 54: 17-21.
  23. Nwokolo OO, Coombs AAT, Eltzschig HK, Butterworth JF. Diversity and inclusion in anesthesiology. *Anesth Analg* 2022; 134(6): 1166-74.
  24. Mottiar M. Because it's 2018: women in Canadian anesthesiology. *Can J Anaesth* 2018; 65(8): 953-4
  25. Harada K, Ozaki A, Murayama A, Tsuji A, Miyachi T, Yamamoto K, et al. Woman Editors-in-Chief of English-Language Medical Journals Published by the Japanese Professional Medical Associations. *JMA J* 2022; 5(1): 114-7.
  26. European Society of Intensive Care Medicine. Diversity Task Force. Available from: URL: <https://www.esicm.org/the-esicm/diversity/>. Accessed Oct 5, 2022.
  27. Canadian Critical Care Society. Diversity Policy. Available from: URL: <https://canadiancriticalcare.org/resources/Documents/3.%20CCCS%20Diversity%20Policy%2011%20April%202018.pdf>. Accessed Oct 5, 2022.
  28. Laake JH, Astvad M, Bentsen G, Escher C, Haney M, Hoffmann-Petersen J, et al. A policy for diversity, equity, inclusion and anti-racism in the Scandinavian Society of Anaesthesiology and Intensive Care Medicine (SSAI). *Acta Anaesthesiol Scand* 2022; 66(1): 141-4.
  29. American Society of Anaesthesiologists. Diversity, equity, and inclusion policies for ASA. Available from: URL: <https://www.asahq.org/about-asa/work-at-asa/diversity/policies#:~:text=ASA%20is%20committed%20to%20ensuring,person%20brings%20to%20their%20work> Accessed Oct 5, 2022.
  30. European Society of Anaesthesiology and Intensive Care (ESAIC). ESAIC Gender Equity Committee. <https://esaic.org/esaic-gender-equity-committee-call-to-action/>. Accessed Oct 5, 2022.
  31. Nogrady B. 'Game-changing' gender quotas introduced by Australian research agency. *Nature*. 2022 Oct 17. doi: 10.1038/d41586-022-03285-4. [Epub ahead of print]
  32. National Institutes of Health. Diversity Related Funding Opportunity Announcements. Available from: URL: <https://extramural-diversity.nih.gov/guidedata/data>. Accessed May 11, 2023.

**Appendix 1.** Catalog information, publication characteristics, and metrics of journals

| Journal   | p-ISSN    | Country     |             | Primary language | Category quartile | IF (2022) | IF (5-year) | H-index* | H-index <sup>†</sup> (5-year) | First publication | Publication counts <sup>†</sup> |        |
|---|-----------|-------------|-------------|------------------|-------------------|-----------|-------------|----------|-------------------------------|-------------------|---------------------------------|--------|
|   |           | Journal     | Publisher   |                  |                   |           |             |          |                               |                   | PubMed                          | WoS    |
| <i>Acta Anaesthesiologica Scandinavica</i>                            | 0001-5172 | Denmark     | US          | English          | Q4                | 2.1       | 2.1         | -        | 19                            | 1957              | 9322                            | 11,260 |
| <i>Anaesthesia</i>  | 0003-2409 | UK          | US          | English          | Q1                | 10.7      | 8.4         | -        | 49                            | 1946              | 20,813                          | 27,178 |
| <i>Anaesthesia and Intensive Care</i>                                 | 0310-057X | Australia   | UK          | English          | Q4                | 1.5       | 1.9         | 74       | 10                            | 1972              | 7153                            | 7490   |
| <i>Anaesthesia Critical Care &amp; Pain Medicine</i>                  | 2352-5568 | France      | France      | English          | Q1                | 5.5       | 4.5         | 36       | 23                            | 2015              | 1298                            | 1257   |
| <i>Anaesthesiologie / Die Anaesthesiologie</i>                        | 2731-6858 | Germany     | Germany     | German           | Q4                | 1.1       | 1.1         | 4        | 4                             | 1994              | 302                             | 222    |
| <i>Anästhesiologie &amp; Intensivmedizin</i>                          | 0170-5334 | Germany     | Germany     | Multilingual     | Q4                | 0.7       | 0.5         | 22       | 9                             | 1999              | -                               | 3589   |
| <i>Anesthesiologie Intensivmedizin Notfallmedizin Schmerztherapie</i> | 0939-2661 | Germany     | Germany     | Multilingual     | Q4                | 0.4       | 0.5         | 23       | 4                             | 1980              | 3555                            | 3515   |
| <i>Anesthesia and Analgesia</i>                                       | 0003-2999 | US          | US          | English          | Q1                | 5.9       | 5.7         | -        | 46                            | 1922              | 27,594                          | 38,247 |
| <i>Anesthesiology</i>   | 0003-3022 | US          | US          | English          | Q1                | 8.8       | 8.4         | -        | 45                            | 1940              | 25,087                          | 34,545 |
| <i>Best Practice &amp; Research-Clinical Anaesthesiology</i>          | 1521-6896 | UK          | Netherlands | English          | Q2                | 4.8       | 4.6         | 70       | 19                            | 1987              | 989                             | 877    |
| <i>BMC Anesthesiology</i>   | 1471-2253 | UK          | UK          | English          | Q3                | 2.2       | 2.6         | 49       | 22                            | 2001              | 2832                            | 2714   |
| <i>Brazilian Journal of Anesthesiology</i>                            | 0104-0014 | Brazil      | US          | English          | Q4                | 1.3       | 1.3         | 9        | 9                             | 1951              | 1293                            | 455    |
| <i>British Journal of Anaesthesia</i>                                 | 0007-0912 | UK          | UK          | English          | Q1                | 9.8       | 9.6         | -        | 48                            | 1923              | 21,003                          | 24,619 |
| <i>Canadian Journal of Anesthesia</i>                                 | 0832-610X | Canada      | US          | English          | Q2                | 4.2       | 4.2         | 109      | 25                            | 1954              | 9276                            | 9683   |
| <i>Clinical Journal of Pain</i>                                       | 0749-8047 | US          | US          | English          | Q2                | 2.9       | 3.8         | 133      | 23                            | 1985              | 3276                            | 3347   |
| <i>Current Opinion in Anesthesiology</i>                              | 0952-7907 | US          | US          | English          | Q3                | 2.5       | 2.9         | 75       | 21                            | 1988              | 2903                            | 2174   |
| <i>European Journal of Anaesthesiology</i>                            | 0265-0215 | UK          | US          | English          | Q2                | 3.6       | 4.4         | 81       | 23                            | 1996              | 5682                            | 8649   |
| <i>European Journal of Pain</i>                                       | 1090-3801 | UK          | US          | English          | Q2                | 3.6       | 3.9         | 122      | 27                            | 1997              | 3428                            | 3538   |
| <i>International Journal of Obstetric Anesthesia</i>                  | 0959-289X | UK          | UK          | English          | Q3                | 2.8       | 2.6         | 57       | 16                            | 1991              | 2693                            | 2591   |
| <i>Journal of Anesthesia</i>  | 0913-8668 | Japan       | Japan       | English          | Q3                | 2.8       | 2.5         | 51       | 19                            | 1987              | 4253                            | 2843   |
| <i>Journal of Cardiothoracic and Vascular Anesthesia</i>              | 1053-0770 | US          | US          | English          | Q3                | 2.8       | 2.5         | 86       | 32                            | 1987              | 9833                            | 8742   |
| <i>Journal of Clinical Anesthesia</i>                                 | 0952-8180 | US          | US          | English          | Q1                | 6.7       | 6.2         | 77       | 28                            | 1988              | 6759                            | 6509   |
| <i>Journal of Clinical Monitoring and Computing</i>                   | 1387-1307 | Germany     | Germany     | English          | Q3                | 2.2       | 2.1         | 47       | 19                            | 1985              | 2448                            | 2178   |
| <i>Journal of Neurosurgical Anesthesiology</i>                        | 0898-4921 | US          | US          | English          | Q2                | 3.7       | 2.9         | 65       | 16                            | 1989              | 2194                            | 2211   |
| <i>Korean Journal of Anesthesiology</i>                               | 2005-6419 | South Korea | South Korea | English          | Q2                | 2.9       | 4.8         | 41       | 18                            | 1968              | 2409                            | 2066   |
| <i>Minerva Anestesiologica</i>  | 0375-9393 | Italy       | Italy       | Multilingual     | Q2                | 3.2       | 2.9         | 61       | 17                            | 1953              | 10,179                          | 3588   |
| <i>Pain</i>   | 0304-3959 | US          | US          | English          | Q1                | 7.4       | 7.7         | -        | 45                            | 1975              | 11,889                          | 11,975 |
| <i>Pain Medicine</i>  | 1526-2375 | US          | UK          | English          | Q2                | 3.1       | 3.4         | 112      | 30                            | 1992              | 5216                            | 5435   |
| <i>Pain Physician</i>   | 1533-3159 | US          | US          | English          | Q2                | 3.7       | 3.9         | 95       | 26                            | 1998              | 2928                            | 2491   |
| <i>Pain Practice</i>  | 1530-7085 | US          | US          | English          | Q3                | 2.6       | 2.9         | 62       | 17                            | 2001              | 1887                            | 1577   |
| <i>Pediatric Anesthesia</i>   | 1155-5645 | UK          | US          | English          | Q4                | 1.7       | 2.3         | 85       | 15                            | 1991              | 6339                            | 6526   |
| <i>Perioperative Medicine</i>   | 2047-0525 | UK          | UK          | English          | Q3                | 2.6       | 3.2         | 31       | 13                            | 2012              | 399                             | 399    |
| <i>Regional Anesthesia and Pain Medicine</i>                          | 1098-7339 | UK          | UK          | English          | Q1                | 5.1       | 5.7         | 107      | 32                            | 1976              | 4279                            | 4369   |
| <i>Schmerz</i>  | 0932-433X | Germany     | Germany     | German           | Q4                | 1.0       | 0.9         | 44       | 8                             | 1987              | 2452                            | 2118   |

p-ISSN: Print-ISSN; e-ISSN: Electronic ISSN; IF: Impact factor; WoS: Web of Science; US: United States; UK: United Kingdom; \*: Calculated for journals with fewer than 10,000 publications as of March 27, 2024. †: Recorded as of March 27, 2024.