Original Article

Survey of challenges and insights into the peer review process in anesthesiology and pain journals: An editorial perspective

ABSTRACT

Background: Peer review has been the cornerstone of academic publishing for nearly 400 years, serving as a critical gatekeeping mechanism for new knowledge. However, it faces significant criticisms, including reviewer fatigue, superficial evaluations, and potential biases. This study aims to explore the peer review process within anesthesiology and pain medicine journals from the editors' perspectives, focusing on criteria for selecting reviewers and managing divergences between peer reviewers and authors.

Methods: We conducted an online survey targeting editors in anesthesiology and pain medicine journals listed in the Scopus database. A total of 2083 unique editors were identified, and invitations to participate were sent via email, supplemented by reminders. The survey consisted of 27 questions regarding editorial roles, reviewer selection, and challenges in the peer review process.

Results: A total of 207 editors entered the final analysis (9.9% of the sample). The survey revealed that most editors prioritize familiarity with reviewers' expertise over diversity of perspectives. A notable 61.8% of editors reported moderate workloads, yet challenges such as securing qualified reviewers and managing reviewer burnout were prevalent. While 55.8% expressed satisfaction with the current system, 69.9% identified a need for better reviewer training, and 8.3% suggested compensating reviewers as a potential enhancement to the process.

Conclusions: Our findings highlight significant strengths and weaknesses in the peer review process for anesthesiology and pain medicine journals. There is an urgent need for improved strategies to diversify the reviewer pool and provide adequate training and support for reviewers.

Key words: Anesthesia, editor, peer review

Introduction

The origin of peer-reviewing traces back nearly 400 years, with one of the earliest formal review systems introduced by the Royal Society of Edinburgh in 1731; prior to this, decisions on what to include or exclude

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in academic publications were largely at the discretion of the editor.[1,2]

Nowadays, the peer review process is the cornerstone of academic publishing, where experts in a specific field evaluate and critique research articles submitted for publication[3]; in this system, peer-reviewers act as critical gatekeepers, regulating the entry of new knowledge into the academic publishing system.

However, while the peer review system is generally well accepted by authors, even when their manuscripts are rejected,[4] it is not without its criticisms. For example, this system can sometimes overlook groundbreaking studies that employ innovative methods or unconventional ideas;[4,5] moreover, reviewer fatigue and burnout not only cause delays in the review process but may also result in superficial evaluations, further slowing the dissemination of important, novel findings and potentially limiting the advancement of scientific knowledge.[5,6]

Given the above framework, it is of paramount importance to understand which criteria guide editors in choosing these gatekeepers and how divergences between peer-reviewers and authors are managed in order to create a fair peer review process.[2]

The expanding field of anesthesia and its research output

The academic landscape of anesthesiology and critical care medicine has expanded substantially over the past 2 decades, driven by both the refinement of technologies and the growing complexity of perioperative care. Advances such as ultrasound-guided procedures, enhanced recovery after surgery (ERAS) protocols, and precision perioperative medicine have expedited the growth of subspecialties, including regional anesthesia, pain medicine, obstetric, pediatric, and cardiac anesthesia.[7] This diversification has fueled not only an increase in research output but also the proliferation of specialized journals and the significant expansion of general anesthesiology journals to accommodate broader scopes. According to a bibliometric analysis, the number of anesthesia-related articles in specialty journals reached 69,593 by 2018, averaging 3480 articles per year from 1999 to 2018.[8] When including publications from anesthesia departments in nonspecialty journals, the total output surged to 167,501, surpassing 10,000 articles per year by 2014; moreover, authors highlight that only 30.4% of articles written by anesthesiologists were published in anesthesiology journals.[8] Similarly, another author estimated that from 2011 to 2020, annual publications nearly doubled—from 1201 to 2253.[9] This increase is paralleled by journal growth: Journal Citation Reports (JCR) listed 18 anesthesiology journals in 2007, rising to 68 by 2025; in the same year, Scopus listed 139 anesthesia journals in the same year.[10,11] This rapid expansion places considerable strain on peer reviewers and editors, who face increasing submission volumes and time pressures. It has been estimated that the total number of research products has grown exponentially as in 2022, the article total was ~47% higher than in 2016, outpacing the limited growth – if any – in the number of practicing scientists.[12] Thus, publication workload per scientist has increased dramatically. We define this problem as "the strain on scientific publishing".[12] Despite this, no systematic studies have evaluated peer-review processes within anesthesiology journals, revealing a significant and unaddressed gap in the literature.

Our study aimed to evaluate the peer review process in anesthesiology and pain journals from the editors' perspectives. We examined how editors assess the suitability of manuscripts for peer review, select reviewers, provide instructions, and integrate reviewer feedback to make final publication decisions.

Methods

Population of interest

The population of interest consisted of editors serving as Editor-in-Chief (EIC), Deputy EIC, Section Editors (SE), and Associate Editors (AE) in the editorial boards of journals within the field of anesthesia and pain medicine; to compile a list of relevant journals, we chose to use the Scopus "Anesthesia and Pain Medicine" category as our reference. For each journal in this category, we accessed the "Editorial Board" page on the respective journal's website to retrieve and download the names of the editors.

Using this list, we built a database that included the following information: name, journal, editorial position, and email address. If an email address was not available on the journal's website, we employed the following steps to obtain a valid contact: First, we reviewed the editor's most recent articles indexed on PubMed, working backward from the newest to the oldest, until a valid email address was found. If no valid address was available, or if the email was inactive, we made a final attempt to locate it through the website of the editor's most recent known affiliation.

Ethical considerations

The questionnaire and dissemination plan were submitted for review to the "Comitato Etico per la sperimentazione Clinica", that is, the Institutional Review Board of the University Hospital of Padua (protocol reference: 2024/37713). Considering the nature of the study, the Institutional Review

Board responded that a formal approval was not required. The consent to participate in the survey was informed, and after explaining the project to participants, an electronically written confirmation was required to access the questions. It was not appropriate or possible to involve patients or the public in the design, or conduct, or reporting, or dissemination plans of our research.

Survey design

An online survey was conducted using the tool Google Form (Google, Mountain View, California, United States). A literature review was conducted to identify existing validated surveys; however, none were found. As a result, a new survey tool was developed, with each item designed according to Peterson's BRUSO model (brief, relevant, unambiguous, specific, and objective).[13]

Noting that different journals use varying titles for editorial roles, we decided to ask each editor at the beginning of the questionnaire with a semiclosed question to select the title that best described their role among "Editor-in-Chief," "Deputy Editor-in-Chief," "Section Editor," and "Associate Editor."

The created tool then underwent a two-phase pretesting process to refine its content.

In the first phase, a part of the survey team carefully reviewed the items, focusing on overall survey flow, typographical errors, and potential skip logic issues. Skip logic errors occur when respondents may inadvertently bypass sections of the survey based on their previous answers, leading to incomplete data collection.

In the second phase, the survey tool was reviewed by physicians from the (Anonymized for peer review) who serve as editors for journals in the "Anesthesiology and Pain Medicine" category to obtain feedback focused on the appropriateness and completeness of the survey, as well as the estimated time required for completion, which was determined to be between 5 and 10 minutes.

The final questionnaire comprised 27 questions displayed in two pages and presented in the same order to all respondents and is available for consultation as Appendix 1. No incentives (e.g., monetary, prizes, or nonmonetary incentives) were offered at any stage to the population of interest.

The Checklist for Reporting Results of Internet E-Surveys (CHERRIES) was utilized to enhance the accuracy and transparency of the study's reporting.[14]

Survey distribution plan

We implemented two strategies to improve the survey distribution.

The first strategy involved contacting editors via email, with three planned reminders if no response was received. During the survey, editors were given the option to provide their names. If an editor chose to provide their name, no further reminders were sent. However, for those who remained anonymous, as the survey did not collect email addresses or any identifying information, up to three reminders were issued.

Moreover, in addition to the planned distribution plan, some editors requested to receive a copy of the survey as an email attachment to fill out, in order to avoid using the Google Form tool. This request was accommodated for the requesting editors and implemented starting from the first round of reminders.

The second strategy involved reaching out to all the Editors-in-Chief of the included journals, requesting them to distribute the survey to their editorial boards. This approach served two purposes: First, we aimed to receive the endorsement of the EIC as support from a community leader is known to increase survey response rates,[15] and second, we aimed to reach out editors we were not able to contact via mail due to missing or outdated email addresses as some editors' contact information might have changed due to institutional transitions.

We did not implement a strategy to prevent multiple entries from the same individual, instead relying on the ethics and understanding of survey methodology within our target population (editors). This approach was aligned with our data protection policy (discussed below) and aimed to avoid IP checks, log file analysis, or requiring editors to link their email addresses to their response.

Data protection

The questionnaire was entirely anonymous, and no personal data from participants were collected; however, as mentioned earlier, participants could voluntarily provide their names solely to prevent unwanted reminder emails.

During data collection, access to the database was restricted to two authors using their institutional credentials. To ensure data security, the online database was deleted once the survey was completed. For editors who requested an attached copy of the survey via email, their responses were added to the database and the email deleted. At the end of the survey, a single copy of the data was then saved locally in an Excel

file (Microsoft Corporation, USA) on the personal computer of the survey's principal investigator (Anonymized for peer review), with password protection known only to him, for the purpose of analyzing the survey results.

Deidentified survey data generated and analyzed in this study are available upon reasonable request.

Statistical analysis

As detailed in the results section, we identified a total population of 2083 editors. To achieve a representative sample with 95% confidence and a 10% margin of error, we estimated that we needed a minimum number of 92 editors to complete the survey.

Nonnormally distributed variables are reported as medians with interquartile ranges (first and third quartiles), while categorical variables are expressed as frequencies and percentages.

Wave analysis

Wave analysis is a survey research technique used to assess potential nonresponse bias by comparing the characteristics and responses of participants who completed the survey at different times.[16] This method is particularly useful as late responders exhibit traits similar to nonresponders and by analyzing these groups, we aimed to identify any significant differences that could suggest bias in the responses. In our study, we divided the survey responses into two groups: the first 10% of responses (early responders) and the last 10% of responses (late responders). These two groups were then compared with the Mann–Whitney U test to compare nonnormally distributed variables, while categorical variables were compared between groups using the Chi-square test or Fisher's exact test, where appropriate. *P* values less than 0.05 were considered statistically significant. All statistical analyses were performed using R version 4.4.1.

Results

We included 113 journals [see Appendix 1] in our analysis accounting a total of 2242 editors; however, after removing duplicate entries—where an editor served on two or more journals—the final number of unique editors included was 2083 representing the total number of identified EIC, Deputy EIC, SE, and AE in anesthesia and pain medicine journals.

Invitations and follow-up reminders were sent between August 24 and September 26, with responses accepted until September 29.

A total of 214 (10.3%) individuals responded to our survey. However, one declined to participate without providing a reason, and five others declined due to not having handled a manuscript, resulting in 207 editors (9.9%) who completed the survey. In our analysis, 67 journals (59.2% of the total) were represented by at least one editor.

The response rate for individual questions ranged from 94.7% to 100%, with 20 out of 27 questions achieving a response rate of 99% or higher [See Appendix 1].

Editor characteristics [Table 1]

Our analysis included 22 EIC (or Deputy EIC), 42 SE, and 143 AE. EICs had the most editorial experience, with 54.5% having served as editors for over 10 years, while Associate Editors were the least experienced, with 72.0% having been editors for less than 5 years. The declared editor workload is overall moderate as 61.8% reported handling fewer than five submissions per month. Desk rejection has been reported as relatively uncommon in anesthesia and pain medicine journals in our survey, with most editors reporting a desk-rejection rate of less than 25%, primarily due to poor writing quality (63.3%).

Selection of reviewers [Table 2]

Editors reported that the ideal number of reviewers for assessing a research article is two or three. However, to secure this number, most editors need to invite three times or more the number of required reviewers. When selecting reviewers, editors primarily rely on personal knowledge of the reviewers' expertise in the field (78.7%), while the least common approach is accepting reviewer suggestions from the manuscript's authors (19.3%).

In terms of desirable qualities in reviewers, expertise was the top priority (91.3%), though promptness in completing the review was also highly valued (62.8%). However, diversity of perspectives was not a primary concern, with only 18.8% of editors considering it a priority. Of the factors influencing diversity of perspectives, different geographical locations scored highest at 8 (on a scale of 1 to 10), while gender and ethnicity scored lower, at 5 (2–7) and 4 (1.5–7), respectively.

Impartiality and conflict of interest management [Table 3]

Ensuring the impartiality of peer reviewers was a topic of debate among respondents, with some editors expressing that they rely solely on the ethics of reviewers and believe there is no definitive solution to this issue. The most commonly adopted strategy to mitigate bias was anonymizing reviewers' identities from the authors, a practice used by 67.5% of editors.

Regarding conflicts of interest, our data show that AEs and SEs feel less responsible for managing them compared to

Table 1: Editors' characteristics and desk reject

	EIC (*n*: 22)	Section Editor (*n*: 42)	Associate Editor (*n*: 143)	Total (*n*: 207)
How long have you been serving as an editor for a peer-reviewed anesthesia journal?				
<1 year	1 (4.5%)	3 (7.1%)	10 (7.0%)	14 (6.8%)
1-5 years	4 (18.2%)	17 (40.5%)	93 (65.0%)	113 (54.6%)
5-10 years	5 (22.7%)	10 (23.8%)	25 (17.5%)	40 (19.3%)
More than 10 years	12 (54.5%)	12 (28.6%)	15 (10.5%)	39 (18.8%)
How many submissions do you handle as an editor per month?				
Less than 5	2 (1.0%)	26 (61.9%)	100 (69.9%)	128 (61.8%)
5-10	8 (3.9%)	12 (28.6%)	27 (18.9%)	47 (22.7%)
10-20	3 (1.4%)	2 (4.8%)	8 (5.6%)	13 (6.3%)
More than 20	9 (4.3%)	2 (4.8%)	8 (5.6%)	19 (9.2%)
What percentage of submissions do you typically reject without peer review?				
0-25%	6 (27.3%)	29 (69.0%)	101 (70.6%)	136 (65.7%)
25-50%	7 (31.8%)	6 (14.3%)	27 (18.9%)	40 (19.3%)
50-75%	9 (40.9%)	6 (14.3%)	10 (7.0%)	25 (12.1%)
75-100%	0 (0%)	1 (2.4%)	5 (3.5%)	6 (2.9%)
What factors influence your decision to reject a manuscript without peer review?#$				
Lack of relevance to journal scope	20 (90.9%)	21 (50.0%)	86 (60.1%)	127 (61.4%)
Poor quality of writing	11 (50.0%)	28 (66.7%)	92 (64.3%)	131 (63.3%)
Insufficient novelty or significance	18 (81.8%)	30 (71.4%)	79 (55.2%)	127 (61.4%)
Ethical concerns	17 (77.3%)	23 (54.8%)	80 (55.9%)	120 (58.0%)
Inadquate study design*	1 (4.5%)	4 (9.5%)	17 (11.9%)	22 (10.6%)
I have never desk-rejected*	0 (0%)	0 (0%)	7 (4.9%)	7 (3.4%)

#Semiclosed question, $ Multiple answers allowed, *answer suggested from at least one participants in a semiclosed question. EIC - Editor in chief

EICs, stating that it is not their responsibility (12.8% and 23.8%). However, the majority of respondents (56.1%) agreed that the best way to address conflicts of interest is by avoiding the selection of reviewers with known conflicts.

Instructions and feedback [Table 4]

Up to 43.0% of editors do not provide instructions to reviewers. Among those who do, Editors-in-Chief (EICs) stand out as 50.0% offer detailed guidelines. Additionally, EICs provide feedback to reviewers in a high percentage of cases (95.5%). In contrast, Section Editors (SAs) and Associate Editors (AEs) offer feedback less frequently, at 85.7% and 76.9%, respectively.

When faced with contradictory recommendations, the strategy most frequently employed is to base decisions on the comments rather than the recommendations alone (72.5%). Once the review process is complete, editors at all levels make their decisions based on a combination of reviewer recommendations, comments, and their own judgment.

Challenges in the peer-reviews process [Table 5]

Editors face several challenges in the peer-review selection process, with the most pressing being the need to secure willing and qualified reviewers (94.2%), followed closely by ensuring timely reviews (67.1%). Additionally, editors must contend with reviewer fatigue and burnout. Suggested solutions include limiting the number of reviews assigned to each reviewer (80.0%) and rotating reviewers to distribute the workload more evenly (49.8%).

Although 55.8% of editors reported satisfaction with the current peer-review system, many see room for improvement. For example, 69.9% believe better training and support for reviewers are needed. Notably, 8.3% of editors spontaneously suggested that compensating reviewers could enhance the peer-review process, a point raised under the "other" option in the semiclosed questions.

Assessment of nonresponders

An assessment of nonresponder bias is provided in Appendix 1. The characteristics of responders and nonresponders did not differ in terms of the number of manuscripts handled per month or years of experience as editors. However, there may have been bias related to editorial roles, with SE and EIC being underrepresented ($P < 0.001$).

Discussion

The main result of our survey was to highlight critical insights into how editors manage the peer review process, revealing both the strengths and weaknesses inherent in the current system.

Reviewer fatigue and burnout, as described in the Global State of Peer Review Report, has become a growing concern

Table 2: Selection of reviewers

	EIC (*n*: 22)	Section Editor (*n*: 42)	Associate Editor (*n*: 143)	Total (*n*: 207)
How do you typically select reviewers for manuscripts?#$				
Personally known experts in the field	22 (100%)	31 (73.8%)	110 (76.9%)	163 (78.7%)
Recommendations from editorial manager	11 (50.0%)	21 (50.0%)	84 (58.7%)	116 (56.0%)
Suggestions from authors	4 (18.2%)	8 (19.0%)	28 (19.6%)	40 (19.3%)
Online databases (e.g., Publons, ORCID)	9 (40.9%)	9 (21.4%)	45 (31.5%)	63 (30.4%)
Reviewer metrics	6 (27.3%)	11 (26.2%)	53 (37.1%)	70 (33.8%)
Associate editor perform this task*	1 (4.5%)	0 (0%)	0 (0%)	1 (0.5%)
Recent publications on the topic*	0 (0%)	2 (4.8%)	2 (1.4%)	4 (1.9%)
What qualities do you prioritize when selecting reviewers?$#				
Expertise in the manuscript's subject matter	21 (95.5%)	38 (90.5%)	130 (90.9%)	189 (91.3%)
Promptness in completing reviews	17 (77.3%)	29 (69.0%)	84 (58.7%)	130 (62.8%)
Constructive feedback provided	13 (59.1%)	26 (61.9%)	59 (41.3%)	98 (47.3%)
Personal knowledge of the reviewer	14 (63.6%)	15 (35.7%)	47 (32.9%)	76 (36.7%)
Diversity of perspectives	8 (36.4%)	11 (26.2%)	20 (14.0%)	39 (18.8%)
Do you involve early career researchers or junior faculty as reviewers?				
Yes, frequently	5 (22.7%)	10 (23.8%)	48 (33.6%)	63 (30.4%)
Occasionally	16 (72.7%)	26 (61.9%)	61 (4.7%)	103 (49.8%)
Rarely	1 (4.5%)	3 (7.1%)	22 (15.4%)	26 (12.6%)
Never	0 (0%)	3 (7.1%)	12 (8.4%)	15 (7.2%)
Reviewers needed per article	3 (2-3)	3 (2-3)	3 (2-3)	3 (2-3)
Prioritize reviewer selection based on (1-10)	**EIC (*n*: 22)**	**Section Editor (*n*: 39)**	**Associate Editor (*n*: 140)**	**Total (*n*: 201)**
Diverse geographical locations or affiliations	8 (6-9)	8 (6.5-8)	8 (5-8)	8 (5-8)
Different gender	6 (3-8)	6 (2.5-8)	4 (2-7)	5 (2-7)
diverse ethnicity	5 (1-8)	5 (3-7.5)	4 (1-7)	4 (1.5-7)
Number of invitation to complete peer-review	**EIC (*n*: 21)**	**Section Editor (*n*: 40)**	**Associate Editor (*n*: 135)**	**Total (*n*: 196)**
1-5	10 (47.6%)	19 (47.5%)	37 (27.4%)	66 (33.7%)
6-10	8 (38.1%)	9 (22.5%)	48 (35.6%)	65 (33.2%)
11-15	1 (4.8%)	4 (10.0%)	26 (19.3%)	31 (15.8%)
>15	2 (9.5%)	8 (20.0%)	24 (17.8%)	34 (17.3%)

#Semi-closed question, $ Multiple answers allowed, *answer suggested from at least one participants in a semi-closed question. EIC - Editor in chief

Table 3: Impartiality and conflict of interest

How do you ensure the impartiality of selected reviewers?#$				
	EIC (*n*: 22)	**Section Editor (*n*: 42)**	**Associate Editor (*n*: 136)**	**Total (*n*: 200)**
Randomly assigning reviewers	4 (18.2%)	17 (40.5%)	47 (34.6%)	68 (34.0%)
Rotating reviewers at each revision of the manuscript	2 (9.1%)	5 (11.9%)	11 (8.1%)	18 (9.0%)
Rotating reviewers for each manuscript	7 (31.8%)	17 (40.5%)	46 (33.8%)	70 (35.0%)
Blinding reviewer identities from authors	17 (77.3%)	25 (59.5%)	93 (68.4%)	135 (67.5%)
Double blind peer-review *	1 (4.5%)	0 (0%)	0 (0%)	1 (0.5%)
Trust in the reviewers ethics *	0 (0%)	2 (4.8%)	0 (0%)	2 (1.0%)
There is no solution*	0 (0%)	2 (4.8%)	3 (2.2%)	5 (2.5%)
Checking conflict of interest*	2 (9.1%)	0 (0%)	2 (1.5%)	4 (2.0%)
How do you handle conflicts of interest between authors and potential reviewers?#$				
	EIC (*n*: 22)	**Section Editor (*n*: 42)**	**Associate Editor (*n*: 141)**	**Total (*n*: 205)**
Asking reviewers to disclose conflicts before accepting the review	11 (50.0%)	12 (28.6%)	59 (7.8%)	82 (40.0%)
Avoiding reviewers with known conflicts	20 (90.9%)	21 (50.0%)	74 (52.5%)	115 (56.1%)
Managing conflicts on a case-by-case basis	9 (40.9%)	17 (40.5%)	56 (39.7%)	82 (40.0%)
Managing conflict of interest is not my duty	0 (0%)	10 (23.8%)	18 (12.8%)	28 (13.7%)

#Semi-closed question, $ Multiple answers allowed, *answer suggested from at least one participants in a semi-closed question. EIC - Editor in chief

in academic publishing, particularly due to the exponential rise in the demand for peer reviews, while the pool of available reviewers has not expanded at the same rate[17] increasing pressure on a limited number of reviewers, further contributing to burnout and potentially diminishing the quality and thoroughness of the peer-review process.

Table 4: Reviewer reports instruction and evaluation

Do you provide guidelines or instructions to reviewers?#				
	EIC (*n*: 22)	Section Editor (*n*: 42)	Associate Editor (*n*: 143)	Total (*n*: 207)
Yes, detailed guidelines are provided	11 (50.0%)	18 (42.9%)	39 (27.3%)	68 (32.9%)
Yes, but they are general in nature	4 (18.2%)	9 (21.4%)	32 (22.4%)	45 (21.7%)
No, reviewers are expected to know the standards	6 (27.3%)	15 35.7 (%)	68 (47.6%)	89 (43.0%)
Provided by journal*	1 (4.5%)	0 (0%)	4 (2.8%)	5 (2.4%)
How do you evaluate the quality of the manuscript after peer-review?#$				
	EIC (*n*: 22)	Section Editor (*n*: 42)	Associate Editor (*n*: 141)	Total (*n*: 205)
Based on reviewer recommendations	1 (4.5%)	4 (9.5%)	11 (7.8%)	16 (7.8%)
Based on my personal judgment	2 (9.1%)	2 (4.8%)	16 (11.3%)	20 (9.7%)
Based on reviewer comments	4 (18.2%)	6 (14.3%)	23 (16.3%)	33 (16.1%)
All the above	15 (68.2%)	30 (71.4%)	91 (64.5%)	136 (66.3%)
Comments and personal judgment*	0 (0%)	3 (7.1%)	0 (0%)	3 (1.4%)
How do you handle conflicting reviews for the same manuscript?#$				
	EIC (*n*: 22)	Section Editor (*n*: 42)	Associate Editor (*n*: 143)	Total (*n*: 207)
Seeking additional reviews	16 (72.7%)	17 (40.5%)	74 (51.7%)	107 (51.7%)
Mediating between reviewers to reach a consensus	1 (4.5%)	1 (2.4%)	7 (4.9%)	9 (4.3%)
Making an editorial decision based on reviewer comments	17 (77.3%)	33 (78.6%)	100 (69.9%)	150 (72.5%)
Own assessment*	0 (0%)	6 (14.3%)	19 (13.3%)	25 (12.1%)
How often do you provide feedback to reviewers on their reviews?				
	EIC (*n*: 22)	Section Editor (*n*: 42)	Associate Editor (*n*: 143)	Total (*n*: 207)
Always	8 (36.4%)	5 (11.9%)	25 (17.5%)	38 (18.4%)
Sometimes	5 (22.7%)	11 (26.2%)	35 (24.5%)	51 (24.6%)
Rarely	8 (36.4%)	20 (47.6%)	50 (35%)	78 (37.7%)
Never	1 (4.5%)	6 (14.3%)	33 (23.1%)	40 (19.3%)

#Semiclosed question, $ Multiple answers allowed, *answer suggested from at least one participants in a semiclosed question. EIC - Editor in chief

The difficulty in recruiting reviewers is not exclusive to the anesthesia field but is a known and expanding phenomenon in all scientific fields.[18,19]

A notable finding from our analysis is the heavy reliance of editors on their personal knowledge when selecting reviewers, with 78.6% indicating that they prioritize familiarity with the expertise of potential reviewers. This reliance aligns with previous research showing that some journals face an unsustainable dependence on a small group of willing reviewers, often driven by repeated refusals from other invited experts.[18] This overreliance is likely exacerbated by the increasing difficulty in recruiting alternative reviewers. Studies have shown that reviewer invitation acceptance rates are steadily declining over time,[19] raising concerns about the long-term sustainability of a peer-review system based entirely on voluntary contributions. If this trend continues, it could jeopardize the efficiency and integrity of scholarly publishing, prompting the need to reconsider whether the current model remains viable for the future.

While selecting known experts can enhance efficiency and ensure subject-matter accuracy, this practice also raises important concerns. It may inadvertently introduce biases, limit diversity of perspectives, and reinforce homogeneity within the peer-review process, particularly when the same individuals are repeatedly tasked with reviewing. Overreliance on personal networks may also hinder the inclusion of early-career researchers or experts from underrepresented regions or disciplines, ultimately affecting the robustness and fairness of the evaluation process.

Only 18.9% of editors indicated that they prioritize diversity of perspectives in reviewer selection, suggesting that efforts to broaden the range of viewpoints represented in the peer-review process are often insufficient.

Additionally, previous research[17] showed that disparities in peer review contributions across different regions have been observed as researchers in developed nations provide approximately two peer reviews per submission, whereas those in emerging economies provide only about 0.6 peer reviews per submission even if scientists from emerging economies are more likely to accept requests for peer review and complete their evaluations faster than their counterparts in established academic centers.[17]

One potential solution to alleviate reviewer fatigue and burnout is to diversify the pool of peer reviewers, extending beyond the editors' immediate networks of known experts

Table 5: Challenges in peer-review

In your experience, what challenges do you encounter in managing the peer-review process?#$				
	EIC (*n*: 22)	**Section Editor (*n*: 42)**	**Associate Editor (*n*: 143)**	**Total (*n*: 207)**
Finding willing and qualified reviewers	22 (100%)	39 (92.9%)	134 (93.7%)	195 (94.2%)
Ensuring timely reviews	18 (81.8%)	29 (69.0%)	92 (64.3%)	139 (67.1%)
Dealing with conflicts of interest	0 (0%)	1 (2.4%)	2 (1.4%)	3 (1.4%)
Balancing reviewer workload	10 (45.5%)	9 (21.4%)	30 (21.0%)	49 (23.7%)
Poor quality reviews*	0 (0%)	0 (0%)	2 (1.4%)	2 (1.0%)
How do you handle reviewer fatigue or burnout?#$				
	EIC (*n*: 22)	**Section Editor (*n*: 41)**	**Associate Editor (*n*: 142)**	**Total (*n*: 205)**
Rotating reviewers to distribute workload	16 (72.7%)	22 (53.7%)	64 (45.1%)	102 (49.8%)
Offering incentives or recognition for timely and thorough reviews	6 (27.3%)	2 (4.9%)	12 (8.5%)	20 (9.8%)
Limiting the number of reviews per reviewer	20 (90.9%)	33 (80.5%)	111 (78.1%)	164 (80.0%)
Respecting the reviewer decision to decline*	1 (4.5%)	0 (0%)	0 (0%)	1 (0.5%)
Never handled/No solution*	0 (0%)	2 (4.9%)	7 (4.9%)	9 (4.4%)
Not a problem*	0 (0%)	1 (2.4%)	2 (1.4%)	3 (1.5%)
How satisfied are you with the current peer-review process in your anesthesia journal?				
	EIC (*n*: 21)	**Section Editor (*n*: 42)**	**Associate Editor (*n*: 143)**	**Total (*n*: 206)**
Very satisfied	6 (28.6%)	14 (33.3%)	31 (21.7%)	51 (24.8%)
Somewhat satisfied	12 (57.1%)	22 (52.4%)	71 (49.7%)	105 (51.0%)
Neutral	3 (14.3%)	2 (4.8%)	27 (18.9%)	32 (15.5%)
Somewhat dissatisfied	0 (0%)	4 (9.5%)	14 (9.8%)	18 (8.7%)
Very dissatisfied	0 (0%)	0 (0%)	0 (0%)	0 (0%)
What improvements do you think could be made to the peer-review process in anesthesia journals?#$				
	EIC (*n*: 21)	**Section Editor (*n*: 42)**	**Associate Editor (*n*: 143)**	**Total (*n*: 206)**
Implementing double-blind review	5 (23.8%)	19 (45.2%)	59 (41.3%)	83 (40.3%)
Providing better reviewer training and support	16 (76.2%)	28 (66.7%)	100 (69.9%)	144 (69.9%)
Increasing transparency in editorial decisions	10 (47.6%)	11 (26.2%)	39 (27.3%)	60 (29.1%)
Payment*	3 (14.3%)	0 (0%)	14 (9.8%)	17 (8.3%)
Automatic language check before review*	0 (0%)	3 (7.1%)	0 (0%)	3 (1.5%)

#Semi-closed question, $ Multiple answers allowed, *answer suggested from at least one participants in a semi-closed question. EIC - Editor in chief

including individuals from diverse ethnicities, genders, and geographical regions could help mitigate the burden on current reviewers.

The second issue is the lack of incentives for peer reviewers. Peer reviewers volunteer their work as a gift to science and medicine without any payment or reward,[20] and while publishing is essential in the modern 'publish-or-perish' academic model, there are few, if any, incentives to complete accurate peer reviews.[21] Moreover, while peer reviewers are often experts in their field, many have not received thorough training in the peer review process, learning the peer-reviewer methods by a trial-and-error approach[22] and, additionally, as highlighted in our survey, editors do not provide detailed instructions to peer-reviewers, leaving this crucial role in the hands of competent yet, ironically, sometimes incompetent experts.[20]

Despite a majority of editors expressing satisfaction with the current peer-review system (55.6%), our results indicate substantial room for improvement. The overwhelming consensus for enhanced reviewer training (69.8%) and even compensation for reviewers (7.8%) reflects a desire for a more structured and supportive framework.

Importantly, while our study focuses on anesthesiology and pain medicine journals, the challenges identified are not unique to this field. Similar issues—such as reviewer fatigue, declining acceptance rates, overreliance on personal networks, and limited diversity in reviewer pools—have been widely reported across scientific disciplines.[17-19] This growing phenomenon, often described as "the strain on scientific publishing,"[12] reflects the mounting pressures faced by the academic peer-review system globally. Despite attempts to mitigate this issue—such as offering financial incentives or streamlining editorial processes—the system remains in a precarious state. Without substantial reform, including a reconsideration of its fundamental structure, the sustainability of peer review is at serious risk in the near future. Proposed solutions, including expanding reviewer pools, improving reviewer training, adopting recognition systems, and considering alternative peer-review models, are urgently needed and universally applicable across

academic publishing. Our study provides valuable insights into these challenges, though it is not without limitations, which warrant further discussion.

First, the moderate response rate (9.9%). While in a survey it would be preferable to have the highest response rate possible, our response rate was higher than the minimum sample size we planned, permitting us to be significant, despite a moderate response rate that is a common phenomenon in online-based surveys.[23,24]

Second, we based our pool of journals on Scopus "Anesthesia and Pain Medicine" category; however, we recognize that it is arbitrary and selecting different journals could have provided different results.

Conclusion

Overall, our findings underscore the complexities of the peer-review process in anesthesiology and pain medicine journals. As editors navigate the challenges of reviewer selection, impartiality, and workload management, continuous evaluation and adaptation of the peer-review system will be essential for advancing scientific knowledge and maintaining the integrity of academic publishing.

Ethics approval and consent to participate

The questionnaire and dissemination plan were submitted for review to the Institutional Review Board of the University Hospital of Padua, Italy (protocol reference: 2024/37713). The consent to participate in the survey was informed and after explaining the project to participants an electronically written confirmation was required to access the questions.

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Conflicts of interest

There are no conflicts of interest.

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Appendix 1

1. Survey Questionnaire

1) Do you want to participate in this survey? (*Required)
   a. Yes
   b. No

2) For how many journals do you serve as editor?
   a. 1
   b. 2
   c. 3
   d. 4
   e. 5

3) For which of the following journals do you serve as editor? (Select all that apply)
   [Journals list]

4) Given that different journals have varying editorial structures, which of the following roles best describes your position?
   a. Editor In Chief
   b. Deputy Editor In Chief
   c) Section Editor
   d. Associate Editor
   e. Other

5) How long have you been serving as an editor for a peer-reviewed anesthesia journal?
   a. Less than 1 year
   b. 1-5 years
   c. 5-10 years
   d. More than 10 years

6) How many submissions do you handle as an editor per month?
   a. Less than 5
   b. 5-10
   c. 10-20
   d. More than 20

7) What percentage of submissions do you typically reject without peer review?
   a. 0-25%
   b. 25-50%
   c. 50-75%
   d. 75-100%

8) What factors influence your decision to reject a manuscript without peer review? (Select all that apply)
   a. Lack of relevance to journal scope Poor quality of writing
   b. Insufficient novelty or significance
   c. Ethical concerns
   d. Other

9) How do you typically select reviewers for manuscripts? (Select all that apply)
   a. Personally known experts in the field
   b. Recommendations from editorial manager
   c. Suggestions from authors

d. Online databases (e.g. Publons, ORCID)
e. Reviewer metrics
f. Other

10) What qualities do you prioritize when selecting reviewers? (Select all that apply)
a. Expertise in the manuscript's subject matter
b. Previous experience with peer review (Promptness in completing reviews)
c. Previous experience with peer review (Constructive feedback provided)
d. Personal knowledge of the reviewer
e. Diversity of perspectives
f) Other

11) How do you ensure the impartiality of selected reviewers? (Select all that apply)
a. Blinding reviewer identities from authors
b. Rotating reviewers for each manuscript
c. Rotating reviewers at each revision of the manuscript
d. Randomly assigning reviewers
e. Other

12) How do you handle conflicts of interest between authors and potential reviewers? (Select all that apply)
a. Asking reviewers to disclose conflicts before accepting the review
b. Avoiding reviewers with known conflicts
c. Managing conflicts on a case-by-case basis
d. Managing conflict of interest is not my duty
e. Other

13) Do you provide guidelines or instructions to reviewers?
a. Yes, detailed guidelines are provided
b. Yes, but they are general in nature
c. No, reviewers are expected to know the standards
d. Other:

14) How do you evaluate the quality of the manuscript after peer-review?
a. Based on reviewer recommendations
b. Based on my personal judgment
c. Based on reviewer comments
d. All the above
e. Other

15) How do you handle conflicting reviews for the same manuscript? (Select all that apply)
a. Seeking additional reviews
b. Mediating between reviewers to reach a consensus
c. Making an editorial decision based on reviewer comments
d. Other

16) How often do you provide feedback to reviewers on their reviews?
a. Always
b. Sometimes
c. Rarely
d. Never

17) In your experience, what challenges do you encounter in managing the peer- review process? (Select all that apply)
a. Finding willing and qualified reviewers
b. Ensuring timely reviews
c. Dealing with conflicts of interest
d. Balancing reviewer workload
e. Other

18) How do you handle reviewer fatigue or burnout?
(Select all that apply)
a. Limiting the number of reviews per reviewer
b. Offering incentives or recognition for timely and thorough reviews
c. Rotating reviewers to distribute workload
d. Other

19) Do you involve early career researchers or junior faculty as reviewers?
a. Yes, frequently
b. Occasionally
c. Rarely
d. Never

20) How do you address concerns regarding reviewer bias or unfair treatment of authors? (Select all that apply)
a. Investigating complaints and taking appropriate action
b. Encouraging anonymous feedback from authors
c. Offering appeals processes for authors
d. Other

21) What improvements do you think could be made to the peer-review process in anesthesia journals? (Select all that apply)
a. Implementing double-blind review
b. Providing better reviewer training and support
c. Increasing transparency in editorial decisions
d. Other

22) How satisfied are you with the current peer-review process in your anesthesia journal?
a. Very satisfied
b. Somewhat satisfied
c. Neutral
d. Somewhat dissatisfied
e. Very dissatisfied

23) On a scale from 1 to 10, how often do you prioritize selecting reviewers with diverse geographical locations or institutional affiliations to ensure a comprehensive evaluation of anesthesia research?
1-10

24) On a scale from 1 to 10, how often do you prioritize selecting reviewers with diverse gender to ensure a comprehensive evaluation of anesthesia research?
1-10

25) On a scale from 1 to 10, how often do you prioritize selecting reviewers with diverse ethnicity to ensure a comprehensive evaluation of anesthesia research?
1-10

26) How many reviewers do you think are required to effectively assess an original manuscript?
1-10

27) How many potential reviewers do you typically need to invite for a new manuscript to reach the desired number?
a. 1-5
b. 6-10
c. 11-15
d. 16-20
e. 21-25
f. 26-30
g. 31-35
h. 36-40
i. 41-45
j. 46-50
k. >50

2. Included Journals

1. AANA Journal
2. Acta Anaesthesiologica Belgica
3. Acta Anaesthesiologica Scandinavica
4. Acta Colombiana de Cuidado Intensivo
5. Acupuncture and Electro-Therapeutics Research
6. Advances in Anesthesia
7. Agri Dergisi
8. Ambulatory Surgery
9. Anaesthesia
10. Anaesthesia and Intensive Care
11. Anaesthesia and Intensive Care Medicine
12. Anaesthesia, Critical Care and Pain Medicine
13. Anaesthesia, Pain and Intensive Care
14. Anaesthesiology Intensive Therapy
15. Anastheisologie, Intensivmedizin, Notfallmedizin, Schmertztherapie: AINS
16. Anasthesiologie und Intensivmedizin
17. Anestezi Dergisi
18. Anesthesia and Analgesia
19. Anesthesia Reports
20. Anesthesiology
21. Anesthesiology and Pain Medicine
22. Anesthesiology Clinics
23. Anesthesiology Research and Practice
24. Anestheziologie a Intenzivni Medicina
25. Annals of Cardiac Anaesthesia
26. Annals of Intensive Care
27. Annals of Palliative Medicine
28. Bali Journal of Anesthesiology
29. BJA Education
30. BMC Anesthesiology
31. Brazilian Journal of Anesthesiology (English Edition)
32. British Journal of Anaesthesia
33. British Journal of Pain
34. Canadian Journal of Pain
35. Case reports in Anesthesiology
36. Clinical Journal of Pain
37. Colombian Journal of Anesthesiology
38. Critical Care and Resuscitation
39. Current Anesthesiology Reports
40. Current Opinion in Anaesthesiology
41. Current Pain and Headache Reports
42. Der Schmerz
43. Douleur et Analgesie
44. Douleurs
45. Egiptian Journal of Anaesthesia
46. European Journal of Anaesthesiology
47. European Journal of Pain
48. Indian Journal of Anaesthesia
49. International Anesthesiology Clinics

50. International Journal of Obstetric Anesthesia
51. JA Clinical Reports
52. JAMS Journal of Acupuncture and Meridian Studies
53. Journal of Anaesthesiology Clinical Pharmacology
54. Journal of Anesthesia
55. Journal of Anesthesia History
56. Journal of Anesthesia Analgesia and Critical Care
57. Journal of Cardiothoracic and Vascular Anesthesia
58. Journal of Cellular and Molecular Anesthesia
59. Journal of Clinical Anesthesia
60. Journal of Clinical Monitoring and Computing
61. Journal of Headache and Pain
62. Journal of Neuroanaesthesiology and Critical Care
63. Journal of Neurosurgical Anesthesiology
64. Journal of Opioid Management
65. Journal of Oral and Facial Pain and Headache
66. Journal of Pain and Palliative Care Pharmacotherapy
67. Journal of Pain and Symptom Management
68. Journal of Pain Research
69. Journal of Palliative Medicine
70. Journal of Perioperative Practice
71. Journal of Research in Clinical Medicine
72. Korean Journal of Pain
73. Korean Journal of Anesthesiology
74. Local and Regional Anesthesia
75. Medicina Paliativa
76. Medicine Palliative
77. Messanger of Anesthesiology and Resuscitation
78. Middle East Journal of Anesthesiology
79. Minerva Anestesiologica
80. Molecular Pain
81. Neurobiology of Pain
82. Neuromodulation
83. Open Anesthesia Journal
84. Open Pain Journal
85. Paediatric Anaesthesia
86. Pain
87. Pain and Therapy
88. Pain Management
89. Pain Medicine
90. Pain Physician
91. Pain Practice
92. Pain Reports
93. Pain Research and Management
94. Palliative Medicine
95. Palliative Medicine Reports
96. Patient Safety in Surgery
97. Perioperative Care and Operating Room Management
98. Precision Cancer Medicine
99. Regional Anesthesia and Pain Medicine

100. Revista Cilena de Anestesia
101. Revista de la Sociedad Espanola del Dolor
102. Revista Espanola de Anestesiologia y Reanimacion
103. Revista Mexicana de Anestesiologia
104. Saudi Journal of Anaesthesia
105. Scandinavian Journal of Pain
106. Seminars in Arthritis and Rheumatism
107. Seminars in Cardiothoracic and Vascular Anesthesia
108. Southern African Journal of Anaesthesia and Analgesia
109. Sri Lankan Journal of Anaesthesiology
110. Therapeutic Hypothermia and Temperature Management
111. Trends in Anaesthesia and Critical Care
112. Turkish Journal of Anaesthesiology and Reanimation
113. Turkish Journal of Trauma and Emergency Surgery Update in Anaesthesia

3. Responding Editors per Journal

Note that the total number of editors in this table exceeds the number of respondents, as an editor could serve on the editorial boards of multiple journals.

1	BMC Anesthesiology	34
2	Trends in Anaesthesia and Critical Care	19
3	Journal of Anesthesia Analgesia and Critical Care	11
4	Anesthesia and Analgesia	8
5	Paediatric Anaesthesia	
6	Anaesthesia, Critical Care and Pain Medicine	7
7	European Journal of Anaesthesiology	
8	Indian Journal of Anaesthesia	
9	Brazilian Journal of Anesthesiology (English Edition)	6
10	Turkish Journal of Anaesthesiology and Reanimation	
11	Journal of Clinical Anesthesia	
12	Acta Anaesthesiologica Scandinavica	
13	British Journal of Pain	5
14	Pain Physician	
15	Journal of Cardiothoracic and Vascular Anesthesia	
16	International Journal of Obstetric Anesthesia	4
17	Saudi Journal of Anaesthesia	
18	Journal of Clinical Monitoring and Computing	
19	Colombian Journal of Anesthesiology	
20	Anesthesiology	3
21	Minerva Anestesiologica	
22	Regional Anesthesia and Pain Medicine	
23	Acta Anaesthesiologica Belgica	
24	Journal of Neuroanaesthesiology and Critical Care	
25	Perioperative Care and Operating Room Management	
26	Revista Cilena de Anestesia	
27	Journal of Pain and Symptom Management	
28	Journal of Headache and Pain	
29	Anestezi Dergisi	
30	Journal of Anaesthesiology Clinical Pharmacology	
31	Annals of Cardiac Anaesthesia	
32	Anaesthesia	2
33	Current Anesthesiology Reports	
34	European Journal of Pain	
35	Pain Reports	

Contd...

36	Neuromodulation	
37	Journal of Pain Research	
38	Journal of Opioid Management	
39	Critical Care and Resuscitation	
40	Pain Research and Management	
41	Journal of Pain and Palliative Care Pharmacotherapy	
42	Anastheisologie, Intensivmedizin, Notfallmedizin, Schmertztherapie: AINS	
43	Pain and Therapy	
44	Journal of Anesthesia	
45	Anaesthesia, Pain and Intensive Care	
46	British Journal of Anaesthesia	
47	Revista Espanola de Anestesiologia y Reanimacion	
48	Case reports in Anesthesiology	
49	Anaesthesia and Intensive Care Medicine	1
50	Anesthesiology and Pain Medicine	
51	Anesthesiology Clinics	
52	Anestheziologie a Intenzivni Medicina	
53	Middle East Journal of Anesthesiology	
54	Open Pain Journal	
55	Journal of Neurosurgical Anesthesiology	
56	Revista Mexicana de Anestesiologia	
57	Bali Journal of Anesthesiology	
58	Palliative Medicine	
59	Local and Regional Anesthesia	
60	Sri Lankan Journal of Anaesthesiology	
61	Southern African Journal of Anaesthesia and Analgesia	
62	BJA Education	
63	Canadian Journal of Pain	
64	Der Schmerz	
65	Douleur et Analgesia	
66	Scandinavian Journal of Pain	
67	Clinical Journal of Pain	

4. Response Rate per Question

Question Number	Response Rate (%)
1	100
2	100
3	99.0
4	100
5	100
6	100
7	100
8	100
9	100
10	100
11	96.6
12	99.0
13	100
14	100
15	100
16	100
17	100
18	99.0

Contd...

19	100.0
20	98.6
21	99.5
22	99.5
23	97.1
24	98.6
25	98.6
26	94.7
27	94.7

5. Assessment of nonresponders

Variable		Early (*n*: 21)	Late (*n*: 21)	*P*
Editorial Role	Associate Editors	21 (100%)	4 (19%)	<0.001
	Section Editors	0 (0%)	9 (42.9%)	
	Editor in Chief	0 (0%)	8 (38.1%)	
Number of manuscript handled per month	<5	1 (4.8%)	0 (0%)	0.724
	5-10	6 (28.6%)	7 (33.3%)	
	10-20	11 (52.4%)	12 (57.1%)	
	>20	3 (14.3%)	2 (9.5%)	
Years as anesthesia and pain medicine editor	<1 year	11 (52.4%)	11 (52.4%)	0.972
	1-5 years	4 (19.0%)	3 (14.3%)	
	5-10 years	1 (4.8%)	1 (4.8%)	
	>10 years	5 (23.8%)	6 (28.6%)	