

Introduction

To select a journal for the submission of a scientific article for publication, authors consider several factors such as acceptance rate, impact factor (IF), review and publication speed, along with the reach and readership of journals. The publication speed is often correlated to the publication efficiency,¹ and publication time varies across journals and specialty.^{2,3} Availability of the online manuscript submission system and electronic-only form of various journals has decreased the time from submission to publication.^{2,3} In addition to editorial policy and procedures, the number of submitted articles also affects the publication speed.

Several bibliometric studies in various disciplines have addressed the issue of publication speed and factors affecting the publication speed.^{4–6} To the best of our knowledge, none of these studies have been conducted in the field of anesthesiology. This study aimed to retrospectively analyze the publication speed of indexed anesthesiology journals and the factors affecting the publication speed.

Methods

This cross-sectional study was conducted for anesthesiology journals published in 2018, and the study period was from July 2019 to September 2019. Time taken for the acceptance and publication of original articles by the journals were considered as primary outcome measures. Anesthesiology journals indexed in the MEDLINE database 2018 and publishing original articles in the field of anesthesiology were included in the study. The exclusion criteria for journal selection were as follows: published content related exclusively to “pain” or “critical care”, journals publishing only review articles and case reports, and journals with unavailability of data regarding the date of submission, acceptance, and online publication/print publication. Based on these exclusion criteria, we shortlisted 25 journals for analysis.

A set of 12 articles published in 2018 were randomly selected from each journal. The selection of articles was based on the number of issues published in 2018. For example, 1 article was selected from each issue from a journal with 12 issues per year, 2 articles from a journal with 6 issues per year, and 3 articles from a journal with 4 issues per year. For a journal publishing less than 12 original articles per year, all the articles were included in the study. The selection of 12 articles from each journal was performed using computer-generated random number technique to avoid selection bias. The dates of submission, receiving the revised version, acceptance, and publication (online) were obtained from the selected articles and recorded in the data extraction sheet. In case the option for online publication was not available, the date for print publication was considered. Data on IF, advanced online publication (AOP), and article processing charges (APCs) were obtained from the journal website. The acceptance time or peer review time has been defined as the interval between the date of submission to the date of acceptance (SA). The publication time has been defined as the interval between the date of submission and the date of online publication (SP). All the included journals, based on their publication frequency, were categorized into four groups: less than 4, 4, 6, and more than

6 issues per year. Furthermore, the journals were categorized based on IF into four groups: less than 1, between 1 and 2, between 2 and 3, and more than 3 to compare the publication speed.

Statistical analysis

Statistical analysis was performed using R version 3.6.1, a software for statistical computing and graphics (The R foundation, Vienna, Austria). Categorical variables are expressed as frequency or percentages. The data were analyzed for normality by using the Shapiro–Wilks test. Numerical variables are expressed as median \pm interquartile range (IQR). The Mann–Whitney U test and Kruskal–Wallis test were performed to compare two and more than two independent groups, respectively. Pearson’s correlation was used to analyze the correlation between numerical variables. A p -value of < 0.05 was considered statistically significant (Supplemental File 1).

Results

Figure 1 represents the flow diagram of the included and excluded journals and factors analyzed in the study. Overall, 25 journals were included for the final analysis, and 289 original articles were evaluated for dates of submission, acceptance, and online/print publication. Of the total, 7 (28%) journals were found to provide information on APC. Information obtained from journal websites indicated the availability of publication statistics for 7 journals (28%), which provided information on publication speed. Table S1 presents the information on peer review and submission to publication time along with bibliometric parameters of the included journals. The medians (IQR) of SA and SP (in days) of all the journals were 120 (83–167) and 186 (126–246) days, respectively. Table 1 presents the results of comparison of SA and SP between journals with and without AOP and between journals with and without APC. The comparison of SA and SP between journals with respect to the number of issues is shown in Table 2. Figure 2 (A–D) represents the box plot depicting the comparative publication timings with factors such as APC, IF, number of issues published per year, and AOP.

No correlation was found between SA and IF ($r = 0.153$, $p = 0.464$) and between SP and IF ($r = -0.0878$; $p = 0.676$). The median SP of journals having IF less than 1, between 1 and 2, between 2 and 3, and more than 3 was 202, 152, 138, and 245 days, respectively ($p = 0.76$). Figure 3 shows the scatter plot depicting the relation of SP and SA with IF. Figure 4 shows the boxplot depicting a comparison of IF between journals with or without AOP. The IF of journals with AOP was significant higher IF than those without AOP (median 0.22 vs. 1.619; $p = 0.002$).

Discussion

Bibliographic parameters of journals are pivotal not only for the beginners but also for the established authors in their respective fields. In our study, the time from submission to publication was found to be less for journals with AOP.

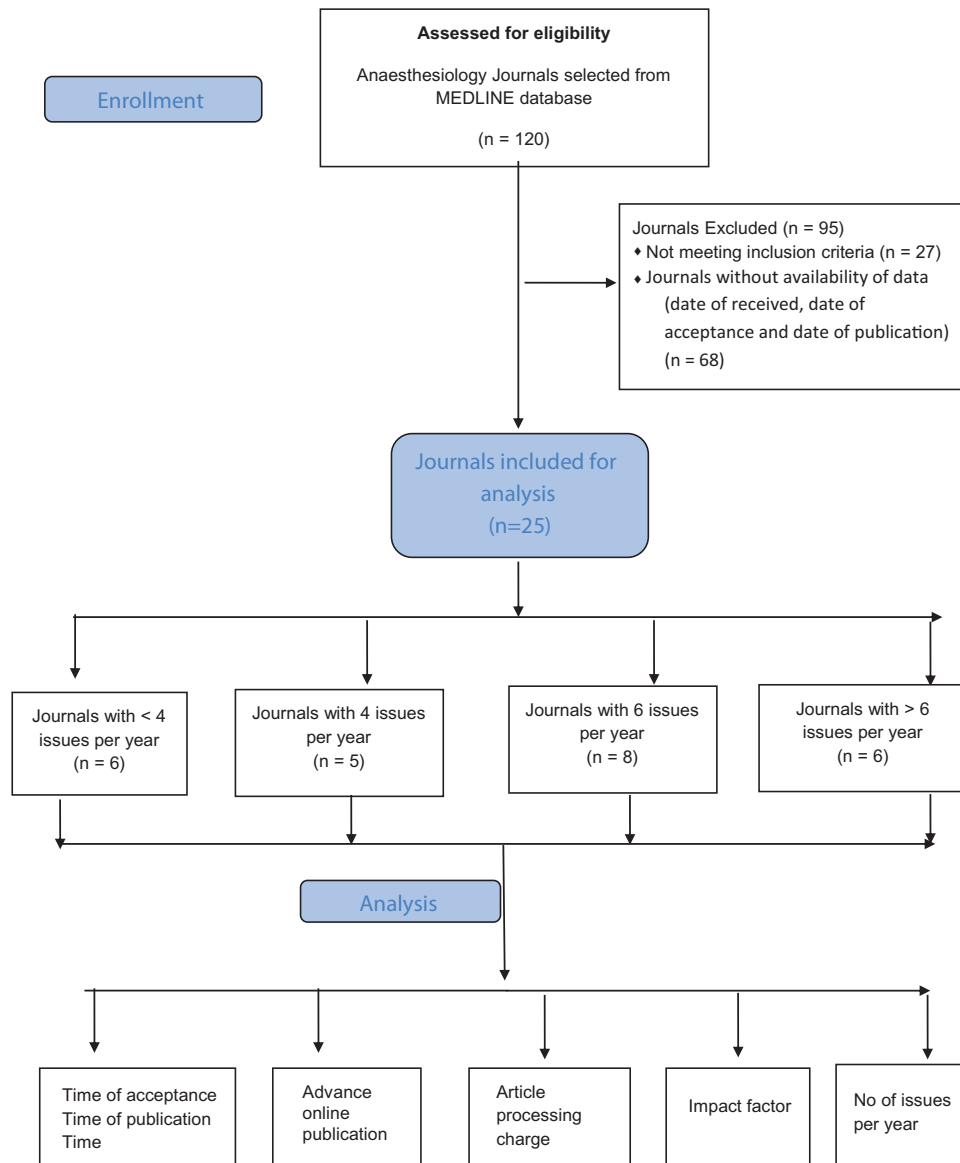


Figure 1 Flow diagram of the included and excluded journals.

Table 1 Comparison of SA and SP between journals with and without AOP and journals with and without APC is shown.

Time period	Article with AOP median time period (days)	Article without AOP ^c median time period (days)	<i>p</i> -value	Article with APC ^d median time period (days)	Article without APC median time period (days)	<i>p</i> -value
SA ^a	107.5	142.75	0.441	111.75	121	0.832
SP ^b	138.5	240	0.011	193.5	157	0.544

^a Submission to acceptance time.

^b Submission to publication time.

^c Advanced online publication time.

^d Article processing charges.

The publication time was not affected by the number of issues per year or the IF of the journal. Moreover, contrary to the common notion, the publication time was not less for journals with APCs.

Asaad et al. conducted an observational study to analyze the time required from submission to acceptance and to online and print publications in six plastic surgery journals during 2018. They concluded that the median time

Table 2 Comparison of SA and SP of journals having less than four issues per year, four issues per year, six issues per year and more than six issues per year is shown.

Time period	< Four issues/year median time period (days)	Four issues/year median time period (days)	Six issues/year median time period (days)	> Six issues/year median time period (days)	p-value
SA ^a	107.5	142.5	120	140.5	0.731
SP ^b	139	224	196	130	0.337

^a Submission to acceptance time.

^b Submission to publication time.

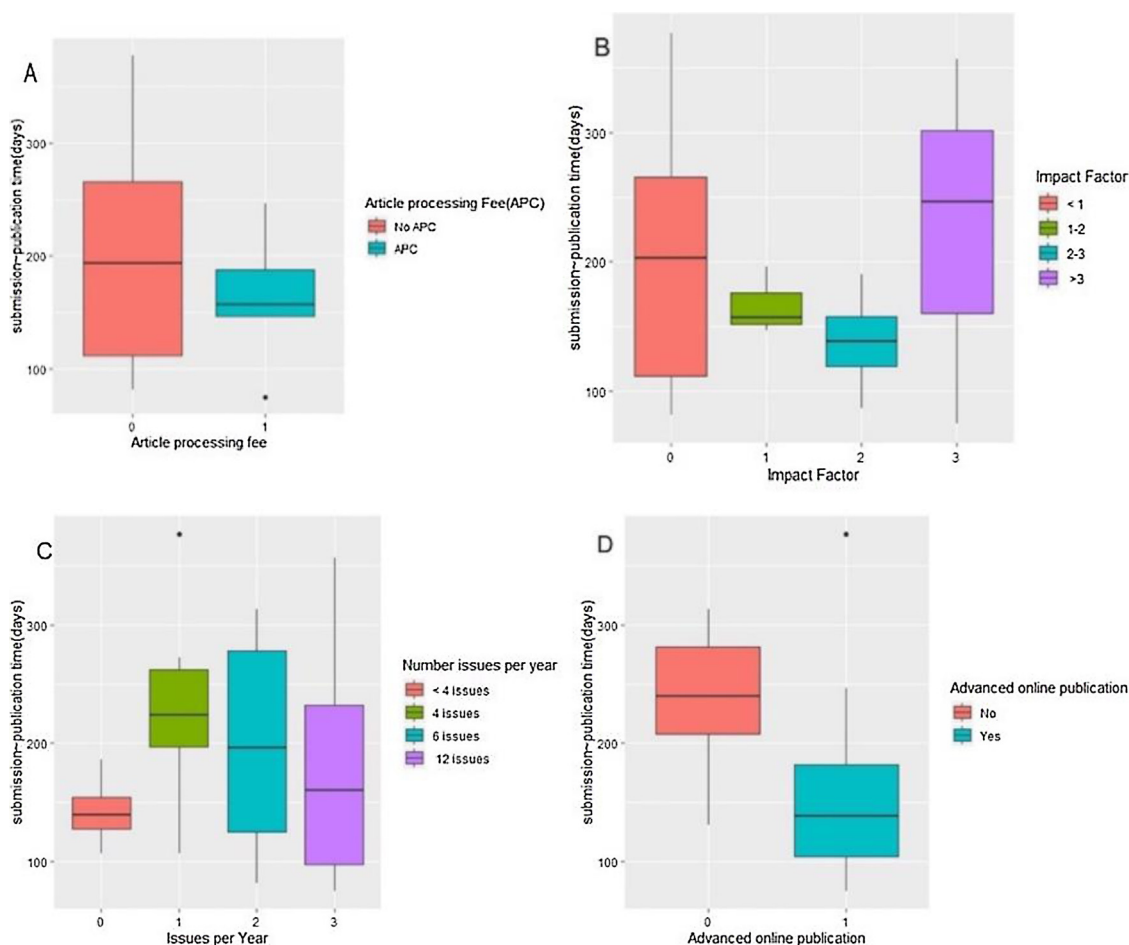


Figure 2 A, Box plot depicting the submission to publication time (SP) in days (median \pm IQR) of journals with article processing charges (APC-1) and without APC (0). B, Box plot depicting SP in days (median \pm IQR) of journals with impact factor (IF) [IF-0 (IF < 1), IF-1 (IF between 1–2), IF-2 (IF between 2–3), IF-3 [IF > 3]] (APC-1). C, Box plot depicting SP in days (median \pm IQR) of journals with number of issues per year (Issues 0: < 2 issues/year, Issues 1: 2 issues/year, Issues 2: 4 issues/year, Issues 3: > 4 issues/year). D, Box plot depicting SP in days (median \pm IQR) of journals with APC-1 and without APC (0).

from submission to in-print publication, from submission to acceptance, and from acceptance to publication was 10.3 months (IQR 8–12.6), 4.6 months (IQR 3–6.8), and 5.4 months (4.2–6.3), respectively.⁵ Stamm et al. conducted a retrospective analysis in head and face medicine for one year and concluded that mean peer review time is 37.8 days and the mean time from submission to acceptance is 95.9 days. The total time from submission to publication was found to be 99.3 days in the study.⁷ Wyness

et al. reported that the peer review process increases the publication time.⁸ In this study, the median peer review time was 120 days. In a study conducted by Chen et al., which included 51 ophthalmic journals, the median peer review time was 133 days and the time from submission to publication was 233 days.² Shah et al. conducted an observational study on biomedical Indian journals and reported that the median peer review time is 143.5 days.³

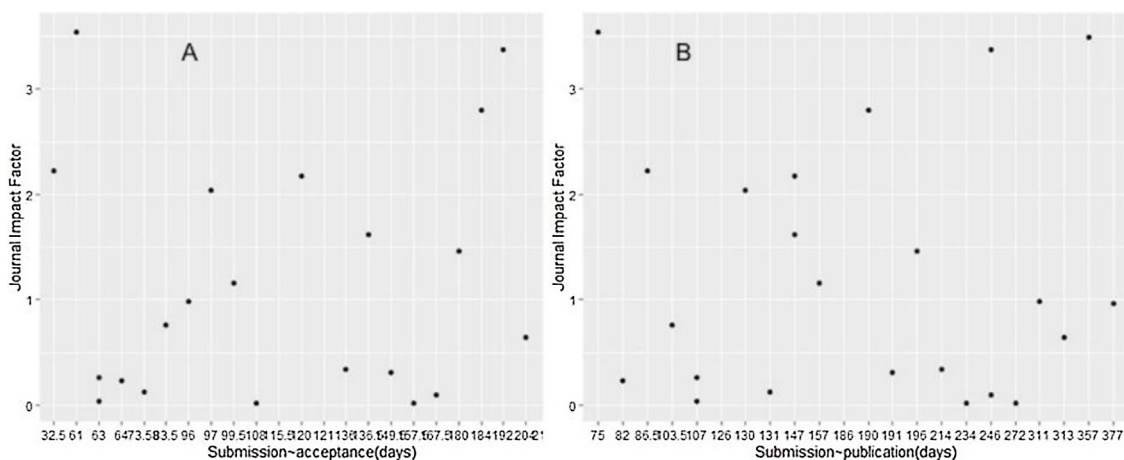


Figure 3 A, Scatter plot depicting the correlation between IF and submission to acceptance time (SA); B, Scatter plot depicting the correlation between IF and SP.

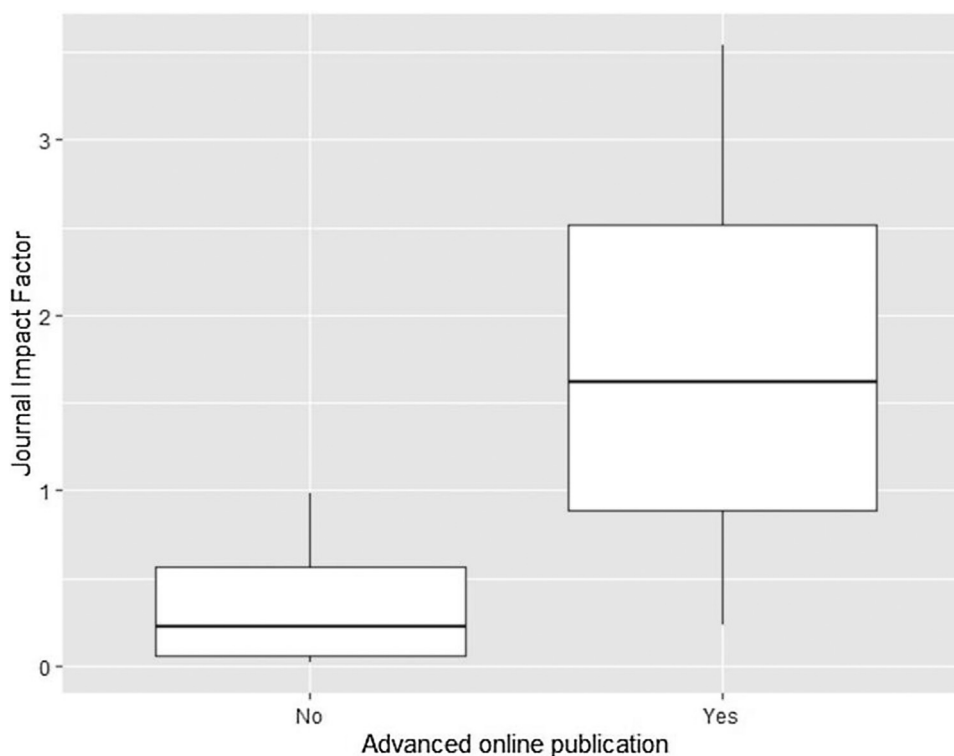


Figure 4 Box plot depicting the effect of IF on advanced online publication (AOP).

The option of AOP is increasingly being provided by various journals worldwide to allow rapid access of research material to readers. Thus, the prospect of AOP facilitates the dissipation of research work and hence evidence-based healthcare. In this study, AOP significantly influenced the total time from submission to publication. However, the time from submission to acceptance, which is a surrogate indicator of the review process, was not found to be influenced by AOP. Shah et al. conducted a study on the Indian biomedical journals cited in the Journal Citation Report of 2013 and reported that AOP is an excellent option to improve the publication speed of journals.³ Additionally, Bagla et al. mentioned that elec-

tronic publication decreases the time from acceptance to publication.⁹

APC is levied to help journals cover the publication-associated costs and those incurred by editorial and peer review systems. It is a debatable topic regarding the dissemination of research work. In our study, the SP time was not shown to be affected by APC ($p = 0.54$). Hence, we confirm that the publication speed remains unaffected by APC (Fig. 2).

The IF was considered an important surrogate indicator for the performance of journals; however, its fallacies were proven later.^{10,11} It is influenced by various factors related to author and journal metrics. We compared the effect of IF

on the time from submission to publication. With increase in IF, SP time was found to decrease. However, the journals with the highest IF ultimately had the longest SP time. This may indicate the high standard of scrutiny of journals with high IFs and the workload owing to the submission of a large number of manuscripts. Kalcioglu et al. conducted a study on otorhinolaryngology journals from 1999 to 2013 and reported similar results in relation to IF. An increase in the number of issues along with the option of AOP may decrease this time. Chen et al. conducted a similar study on ophthalmology journals and concluded that IF does not affect the publication speed and that the availability of AOP significantly increases the publication speed.² Shah et al., in their study on biomedical journals, concluded that IF does not affect the publication speed.³ These results are consistent with that of the present study. In this study, the journals with AOP were found to have a significantly higher IF than those without AOP ($p = 0.002$). These findings are consistent with those reported by Chen et al. ($p = 0.015$).²

We analyzed the effect of the number of issues of a journal per year on SP time. The SP time of the journals, except for those with 2 issues per year (139 days), was found to decrease with increase in the number of issues per year; however, the association was not statistically significant ($p = 0.33$). The result suggests that the number of issues per year may not help in increasing the publication speed. Conversely, Kalcioglu et al. stated that the publication time might be decreased by increasing the number of issues, particularly in high IF journals.⁶

Our study has certain limitations. The subject area was limited exclusively to anesthesiology, and journals related to critical care and pain medicine were excluded. Only original articles were considered to maintain uniformity; these articles mostly have a universal format (IMRaD) and are stringently peer reviewed. However, the publication speed of other article types was not assessed. Additionally, journals indexed in databases other than MEDLINE were not included. Therefore, the study results may not completely represent information regarding publication metrics in anesthesiology journals. The acceptance rate of journals was not analyzed. In case of some journals (for example, the British Journal of Anesthesia), there were some issues with complete online data accessibility. Despite these limitations, this study is a novel attempt to provide a realistic view to the publication speed in indexed anesthesiology journals. Additionally, the effect of APC on publication time was determined in this study, which has not been reported yet.

Through the analysis of various factors that contribute to the publication speed in anesthesiology journals, we advocate that the option of AOP is a great asset to increase the publication speed. Of the journals included in the study, 15 (60%) had the option of AOP. This provision may be imbibed by other journals to improve the publication process. The implementation would definitely require additional resources and adaptation by the production team. As indicated in the study, the publication speed is not affected by APC. Thus, the belief that paid journals publish faster may be misleading. The IF or number of issues of a journal per year may not help in assessing the publication speed. The beginners may choose a journal with the option of AOP

for rapid publication, which will help in individual progress and research appraisal.

Timely dissemination of research findings plays an essential role in evidence generation. Hence, there should be a concerted effort between publishers and authors to identify the bottlenecks and reduce avoidable delays in the publication process. Provision of services such as AOP will be of substantial help because they expedite the overall publication process.

Conflicts of interest

The authors declare no conflicts of interest.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.bjane.2021.02.025>.

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