

# COVID-19 pandemic and its impact on peer review speed of anesthesiology journals: An observational study

Bikram Kishore Behera, Rakesh Vadakkethil Radhakrishnan<sup>2</sup>, Chitta Ranjan Mohanty<sup>1</sup>, Snigdha Bellapukonda

Departments of Anaesthesiology and Critical Care and <sup>1</sup>Trauma and Emergency, All India Institute of Medical Sciences, <sup>2</sup>College of Nursing, All India Institute of Medical Sciences, Bhubaneswar, Odisha, India

## Abstract

**Background and Aims:** Publication of a scientific article in a reputed journal is an uphill task that demands a significant amount of time and effort from the author and editorial team. It is a matter of great enthusiasm for all prospective researchers to know whether this daily evolving publication load of articles during this pandemic had changed the journal's inherent peer review or publication process. We aimed to compare the peer review speed of anesthesiology journal articles published during pandemic (2020) to the previous year and to analyze various factors affecting peer review speed.

**Material and Methods:** Overall, 16 anesthesiology journals indexed in MEDLINE database were retrospectively analyzed. A set of 24 articles published in 2019 of the included journals were selected from each journal for control and a set of 12 articles published between January to September 2020 was selected for comparison. Time taken for acceptance and publication from the time of submission was noted. Peer review timing was calculated and its relationship with h-index, continent of journal origin and article processing charges were evaluated.

**Results:** The median peer review time in 2019 and 2020 were 116 (108-125) days and 79 (65-105.5) days, respectively. There was a 31.8% decrease ( $P = 0.0021$ ) in peer review time of all articles in 2020 compared to 2019. The median peer review timings of COVID-19 articles were 35 (22-42.5) days. A 55.6% decrease was noted in peer review time of COVID-19 articles compared to non-COVID-19 articles in 2020. There was a significant correlation between peer review time and h-index ( $r = 0.558$ ,  $P = 0.024$ ). There was no significant difference in peer review timing of journals with or without article processing charge ( $P = 0.75$ ) and between journals from different continents ( $P = 0.56$ ).

**Conclusion:** Anesthesiology journals managed to curtail their turnaround time for peer review during the pandemic compared to previous year. Journal with higher h-index had longer peer review time. The option for articles processing charge and continent of publishing journal had no impact on peer review speed.

**Keywords:** Anaesthesiology, COVID-19, h-index, peer review time

## Introduction

The coronavirus disease (COVID-19) pandemic is a global health crisis of our time and is one of the most significant challenges humankind has faced since the Second World

War. Its impact on the health care sector is unprecedented and enormous. Rapid publication is paramount for disseminating new knowledge, particularly during this fast-moving health crisis like the COVID-19 pandemic.<sup>[1]</sup> The scientific community is in a rigorous effort to make the best evidence

Address for correspondence: Dr. Chitta Ranjan Mohanty, Department of Trauma and Emergency, All India Institute of Medical Science, Bhubaneswar - 751 019, Odisha, India.  
E-mail: drchitta8@gmail.com

| Access this article online  |                                    |
|---|------------------------------------|
| Quick Response Code:  | Website:<br>www.joacp.org          |
|  | DOI:<br>10.4103/joacp.JOACP_652_20 |

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Behera BK, Radhakrishnan RV, Mohanty CR, Bellapukonda S. COVID-19 pandemic and its impact on peer review speed of anesthesiology journals: An observational study. *J Anaesthesiol Clin Pharmacol* 2021;37:57-62.

Submitted: 07-Dec-2020 Accepted: 23-Dec-2020 Published: 10-Apr-2021

of the disease patterns and its implications as the disease process unveils itself over time. Simultaneously, journals in most medical disciplines strive to publish articles about the pandemic on an unprecedented scale and scope than ever before.<sup>[2,3]</sup> Still, the same cannot be said about the articles in other research areas.<sup>[4,5]</sup> This pandemic has affected both the researchers and reviewers equally and especially those professionals actively engaged in COVID-19 care. Lockdown measures by various governments and agencies worldwide have affected research in other areas of the medical field. This could have led to reduced editorial pressure and the turnaround time for publication.

Publication of a scientific article in a reputed journal is an uphill task that demands a significant amount of time and effort from the author and editorial team. It is a matter of great enthusiasm for all prospective researchers to know whether this daily evolving publication load of articles during this pandemic had changed the journal's inherent peer review or publication process, especially regarding the speed with which the review process and decision on acceptance and publication were accomplished. Hence, the present study aimed to determine the peer-review speed of journal articles in anesthesiology journals during the pandemic period (2020) in comparison to the previous year (2019) and to establish a correlation of various factors to peer review speed among anesthesiology journals.

## Methods

This observational study was conducted for the anesthesiology journals published in the year 2019 and 2020. The study period was from July-October 2020. Time taken for peer review of the original articles was considered as the primary outcome measure. Anesthesiology journals indexed in MEDLINE database 2020 were recruited for the study. Journals publishing original articles in the field of anesthesiology ( $h\text{-index} \geq 20$ ) were included in the study. Journals with published content exclusively related to "pain" or "critical care," journals publishing only review articles and case reports, and journal without data regarding the date of submission, acceptance were excluded from the study. Using this criterion, we had shortlisted 16 journals for inclusion in our analysis.

A set of 24 articles published in 2019 of the included journals were selected from each journal for control. The selection of the articles was based on the number of issues published in the year 2019. For example, two articles were selected from each issue from a journal with 12 issues per year, four articles in a journal with six issues per year, and six articles in a journal with four issues per year, and so on. If the journal published <24

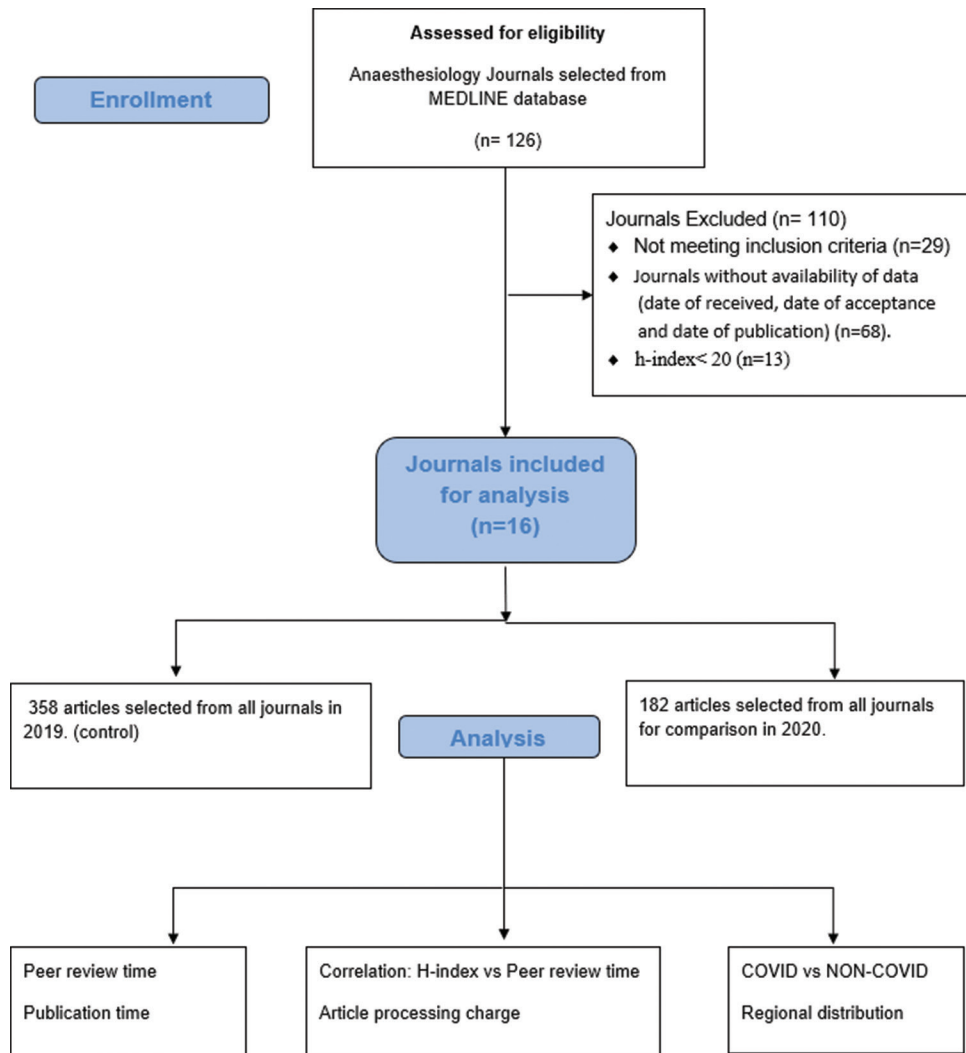
original articles per year, then all the journal articles were included in the study. The first set of articles was selected from each issue to maintain uniformity. The date of submission, date of acceptance, date of publication was obtained from the selected articles and was entered into the data extraction sheet. The data on parameters such as the article processing charges (APC) were obtained from the journal website. The h-index of selected journals was obtained from SCIMAGO.<sup>[6]</sup> A set of 12 articles published between January to September 2020 was selected from the same journal for comparison. If the journal had less than 12 articles, all articles were included. The peer-review time or acceptance time (SA) has been defined as the interval between submission dates to the date of acceptance. The publication time (SP) has been defined as the interval between dates of submission to the date of online publication. The journal's country of origin was listed, and all the journals were categorized into four continents: Asia, Europe, North America, and South America.

## 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 with interquartile range (IQR). The Mann–Whitney U test and Wilcoxon signed-rank test were performed to compare two independent and paired groups, respectively. Kruskal–Wallis test was used to compare more than two independent groups. Spearman's correlation was used to analyze the correlation between numerical variables. A 'P' value of <0.05 was considered statistically significant.

## Results

The flow diagram of the journals selected for the study and the factors analyzed were depicted in Figure 1. Sixteen journals were included for the final analysis. A total of 358 articles were selected from the year 2019, and 181 articles peer-reviewed between January and September were selected from the year 2020. The median peer review time for all articles in 2019 was 116 (108-125) days. The median peer review time in 2020 (during the pandemic period) for all articles was 79 (65-105.5) days. There was a 31.8% decrease in all articles' peer review time during the pandemic period compared to 2019. This decrease was statistically significant ( $P = 0.002$ ). Thirteen journals (81%) have reported a decrease in peer review time during the pandemic period compared to 2019, amongst which four journals (25%) had peer review time significantly less ( $P < 0.05$ ). Out of the



**Figure 1:** Flow diagram showing the layout plan of the study

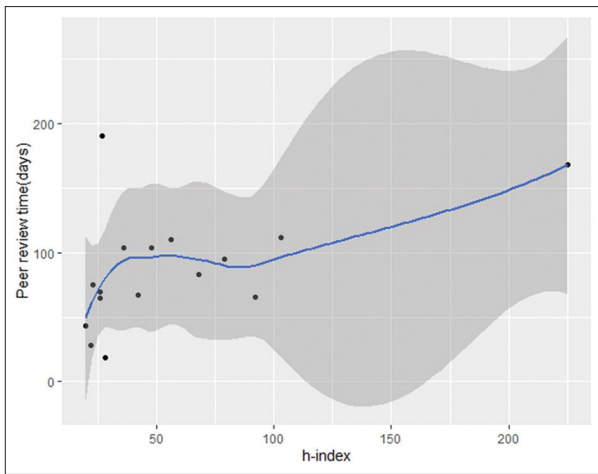
181 original articles published in 2020, 12 (6.6%) articles were published on COVID-19. The median peer review timings of those articles were 35 (22-42.5) days. We found a 55.6% decrease in peer review time of COVID-19 articles compared to non-COVID articles during the pandemic period.

The median publication time for all journals in 2019 was 166 (131-197) days. The median publication time for all journals during the pandemic was 116 (102-133) days. There was a 30.1% decrease in publication time in 2020 compared to 2019. The median h-index of journals include for analysis was 39 (26-70). There was a significant correlation between peer review time and h-index ( $r = 0.558$ ,  $P = 0.024$ ). Figure 2 shows scatter plot depicting the relation between peer review time and h-index. Though the peer review time varies between different continents, as shown in boxplot [Figure 3], it was not statistically significant ( $P = 0.056$ ). The median peer review time is longer in the journal with APC (89.5

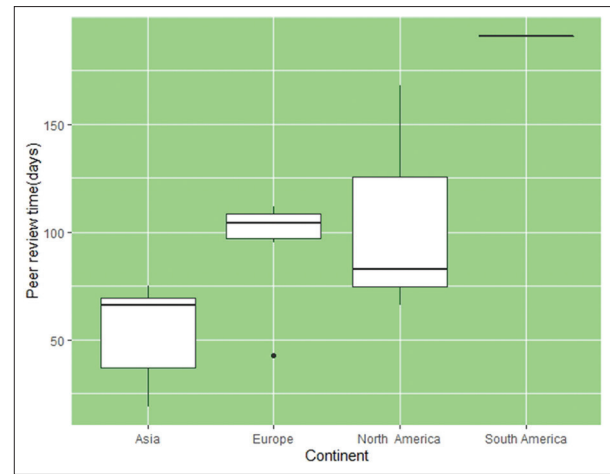
days) than those without (76.5 days), but the difference was not statistically significant ( $P = 0.75$ ). Table 1 depicts comparative Peer review time and its correlates among the indexed anaesthesiology journals.

## Discussion

The scholarly article submitted to a journal must succeed through various time-consuming stages, including peer review and thorough editorial work before getting published. The delay in peer review and editorial process of scientific journals often hinders the timely dissemination of relevant information. It is indeed more expensive during the current pandemic era like COVID-19, where the rapid generation of evidence and its sharing comprise top priority. Since the declaration of the pandemic as a public health emergency of international concern by W. H. O, the journals in almost every medical discipline had witnessed an unprecedented surge in articles related to pandemic over the last nine months, often referred



**Figure 2:** Scatter plot depicting the correlation between h-index and peer review time during the pandemic period



**Figure 3:** Box plot depicting peer review time in journals from different continents of the world during the pandemic period

to as ‘infodemic’ by the experts, putting enormous pressure on the editorial and review team.<sup>[7,8]</sup> The speculations are due to the credibility and quality of the information supplied to the journals that need thorough scrutiny and cutting-edge decisions from the editorial team.<sup>[9]</sup> Although the turnaround time for peer review is often correlated with the journal efficiency with direct reflection of the editorial team’s strength and caliber and supportive network,<sup>[10]</sup> it holds true for the current pandemic. Most journals strived to achieve a prompt response to this crucial need.

We found that thirteen out of the sixteen anesthesiology journals recorded a reduction in the peer review time during the pandemic period (2020) compared to the previous year, out of which four journals demonstrated a statistically significant decrease ( $P < 0.05$ ). The peer-review time varied across the included journals and may depend on different factors of journal efficiency and timely support from the reviewers.<sup>[11]</sup> The current study found that the median peer review time for anesthesiology journals was 116 days in 2019 and 79 days in 2020. The peer-review time varies substantially between journal to journal and across the various medical disciplines. The median peer review time takes around 100 days for most of the biomedical journals<sup>[12]</sup> Asaad M *et al.* reported the median peer review time of 4.6 months (IQR 3-6.8) among six plastic surgery journals during 2018.<sup>[13]</sup> Whereas Head and Face Medicine journals had a mean peer review time of just 37.8 days, as reported in a one-year retrospective study by Stamm T *et al.* in 2007.<sup>[14]</sup> Anesthesiology journals in the current study had comparable peer review time with ophthalmology and biomedical Indian journals that reported median peer review times of 133 days and 143.5 days, respectively, as reported by Chen *et al.* and Shah *et al.* in their earlier bibliometric studies.<sup>[15,16]</sup> The time spend on peer review had a strong bearing on the publication speed of

articles where the longer peer reviews considerably increase the turnaround time for publication.<sup>[17]</sup>

Our study found a 31.8% decrease in all articles’ peer review time and a 69.8% decrease for COVID-19 articles in 2020 compared to 2019 among the anesthesiology journals. In all articles published in 2020, we found the COVID-19 articles had 55.69% less peer review time than non-COVID articles ( $P < 0.05$ ). This could be attributed to comparatively fewer non-pandemic related research submission and the effect of lockdowns that could have eased the editorial team’s pressure and influenced faster peer review and processing. Furthermore, to support the need for rapid dissemination of information related to COVID-19. Notably, some journals had reformed their peer review guidelines to accelerate the publication speed and often invited expert prospective reviewers to strengthen their peer review speed during the pandemic times to circumvent the inherent publication delays.<sup>[18,19]</sup> Our findings corroborate with Horbach SPJM that reported shortening of peer review time for journals during the pandemic.<sup>[4]</sup> Unlike Horbach SPJM, we found the acceleration of peer review for both COVID-19 and non-COVID-19 articles in 2020 among anesthesiology journals, where later reported only COVID-19 articles had a reduction in peer review time.<sup>[4]</sup> This difference may also be explained by the fact that our analysis included only original research articles, not like Horbach SPJM, that accounted for different article types, including letters to editors, commentaries, and review articles that typically undergo a different form review process than original articles.<sup>[4]</sup>

Our analysis included the h-index of included journals, a widely used author, or journal metric to quantify scholarly articles’ collective impact in a journal.<sup>[20,21]</sup> The anesthesia journals included in the study had a median h-index of 39 (26-70). Interestingly, we noted a significant correlation between

**Table No.1 Comparative Peer review time and its correlates among the indexed anesthesiology journals (n = 539)**

| Journal Name                                     | Median peer review Time 2019 (in days) | Median peer review Time 2020 (in days) | P       | h-index | Issues /year | No of Article 2019 (n=358) | No of Articles 2020 (n=181) | APC | Journal Country of origin |
|--|--|--|---------|---------|--------------|----------------------------|-----------------------------|-----|---------------------------|
| Acta Anaesthesiologica Scandinavica              | 109.5                                  | 112                                    | 0.61    | 103     | 10           | 24                         | 12                          | No  | Denmark                   |
| Anaesthesiology                                  | 202                                    | 168                                    | 0.13    | 225     | 12           | 24                         | 10                          | No  | USA                       |
| Anesthesiology and Pain Medicine                 | 112                                    | 75                                     | 0.38    | 23      | 6            | 24                         | 12                          | Yes | Iran                      |
| BMC Anesthesiology                               | 146                                    | 104                                    | 0.248   | 36      | 1            | 24                         | 12                          | Yes | United Kingdom            |
| Brazilian Journal of Anesthesiology              | 162                                    | 191                                    | 0.5     | 27      | 6            | 24                         | 4                           | No  | Brazil                    |
| Canadian Journal of Anesthesia                   | 109                                    | 66                                     | 0.065   | 92      | 12           | 24                         | 12                          | No  | USA                       |
| Indian Journal of Anaesthesia                    | 121.5                                  | 65                                     | 0.002*  | 26      | 12           | 24                         | 12                          | No  | India                     |
| Journal of Anesthesia                            | 152                                    | 67.5                                   | 0.021*  | 42      | 6            | 24                         | 12                          | No  | Japan                     |
| Journal of Anaesthesiology Clinical Pharmacology | 216                                    | 19                                     | 0.048*  | 28      | 4            | 24                         | 5                           | No  | India                     |
| Journal of Clinical Anesthesia                   | 53.5                                   | 83                                     | 0.63    | 68      | 8            | 24                         | 12                          | No  | USA                       |
| Journal of Clinical Monitoring and Computing     | 109                                    | 104                                    | 0.479   | 48      | 6            | 24                         | 12                          | No  | Netherlands               |
| Korean Journal of Anesthesiology                 | 107.5                                  | 70                                     | 0.0009* | 26      | 6            | 24                         | 10                          | No  | Korea                     |
| Minerva Anesthesiologica                         | 177                                    | 110                                    | 0.074   | 56      | 12           | 24                         | 12                          | No  | Italy                     |
| Paediatric Anaesthesia                           | 130.5                                  | 95                                     | 0.109   | 79      | 12           | 24                         | 8                           | No  | United Kingdom            |
| Saudi Journal of Anesthesia                      | 37                                     | 28                                     | 0.151   | 22      | 4            | 12                         | 12                          | No  | India                     |
| Trends in Anaesthesia and Critical Care          | 69.5                                   | 43                                     | 0.375   | 20      | 6            | 24                         | 12                          | No  | United Kingdom            |

\* Wilcoxon signed rank test

peer review time and the h-index ( $r = 0.558, P = 0.024$ ) among the journals. None of the previous bibliometric studies have reported the journals' h-index on the peer review and publication process. It is also imperative to acknowledge that the ultra-rapid peer reviews should not be at the expense of review quality and article credibility, which often gives rise to erroneous faulty information to the readers and serious misleading of the science.<sup>[22]</sup> Many high-end journals relied on rapid dissemination of research evidence with accelerated peer review through their preprint publication, without even rigorous editorial scrutiny; often required retraction of the articles following concerns expressed by experts.<sup>[23]</sup>

We noted a difference in the peer review speed across the anaesthesia journals published from various continents, namely Asia, Europe, North America, and South America. However, the correlation between peer review speed and the publishing journal's continents was not statistically significant ( $P = 0.056$ ). Many journals impose article processing charges (APC) to meet the expenses associated with the editorial process, review, and publication, though having a strong negative bearing on researchers from economically constrained nations.<sup>[24]</sup> Our study found that peer review speed of journals was not affected by APC's option. Furthermore, we noted journals were having APC had longer peer review time (89.5 days) compared to journals that did not levy these charges (76.5 days).

Our study found a median publication time of 166 days for the anesthesiology journals before the pandemic. It was comparable to the publication speed of journals in other disciplines. However, this turnaround time got shortened to 116 days during the pandemic. The findings were in line with the study by Palayew *et al.* that reported a shortening of turnaround time for publication in journals compared to the previous year.<sup>[9]</sup> Furthermore, the current study finding of the shortening of submission to acceptance time also corroborates with a study by Horbach SPJM that reported reduction in turnaround time for publication was mainly attributed to the decrease in the number of days for the peer review among journals during pandemic.<sup>[4]</sup>

Furthermore, concerns are also erupting about the fate of articles not related to the COVID-19 pandemic. Although many journals resorted to speeding the publication of Covid-19 articles, the public interest in non-COVID-19 medical conditions got sidelined<sup>[5]</sup> and these articles endure significant delays in peer review and publication.<sup>[4,9]</sup> This could negatively affect the prospect of young scientists and delayed the dissemination of relevant scientific evidence. The earlier literature suggested a two-track reviewing system of editorial triage to propel both the pandemic and non-pandemic related articles to safeguard the importance of all scientific submissions.<sup>[11]</sup>

Peer review speed is an essential yardstick for tracking the publication speed of articles. It seems logical that journals also

might have encountered problems in getting enough expert reviewers. Peer review services are generally non-remunerated and used to get accomplished from the spare time of medical researchers. Many of these reviewers might be busy with their scholarly work or routine clinical engagement, making review requests overwhelming during the pandemic. But must acknowledge with caution that most of our included journals managed to engage enough reviewers to review their submissions; however, who reviewed these articles so expedite remains unclear.<sup>[4]</sup> Nevertheless, the indispensable need for research evidence and scientific information during any crisis should not overlook the quality of peer review and scholarly content's inherent scrutiny.

The current study has some limitations. Firstly, the peer review timing of only original articles were evaluated in the present study, and other articles like review articles and reports were not included, though account for a sizable share in journals. The study relied on information about data on the date of submission and acceptance from the journal site. We have included only journals indexed in the MEDLINE database, and other anesthesiology journals were not considered. Furthermore, some of the high h-index journals were not included due to the unavailability of dates of submission and acceptance.

To conclude, our analysis revealed that most of the anesthesiology journals managed to curtail their turnaround time for peer review during the pandemic time to showcase solidarity to the global endeavours for rapid information sharing. There was a significant reduction in the peer review time of COVID-19 articles. Journal with higher h-index had longer peer review time. The option for articles processing charges and continents of publishing journals had no impact on peer review speed.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Moradian N, Ochs HD, Sedikies C, Hamblin MR, Camargo CA Jr, Martinez JA, *et al.* The urgent need for integrated science to fight COVID-19 pandemic and beyond. *J Transl Med* 2020;18:205.
2. Chen Q, Allot A, Lu Z. Keep up with the latest coronavirus research. *Nature* 2020;579:193.
3. Lee AY, Lin MW. Rapid publishing in the era of coronavirus disease 2019 (COVID-19). *Med J Aust* 2020;212:535.e1.
4. Horbach SPJM. Pandemic publishing: Medical journals drastically speed up their publication process for Covid-19. *bioRxiv* 2020. doi: 10.1101/2020.04.18.045963.

5. Rogers SK, Hughes M. Forgetting “routine” deep venous thrombosis and stroke during COVID-19 is a parallel pandemic that will be costly if ignored. *J Vasc Surg* 2020;72:761-3.
6. SJR: Scientific Journal Rankings. Last cited on 2020 Oct 19]. Available from: <https://www.scimagojr.com/journalrank.php>.
7. Gazendam A, Ekhtiari S, Wong E, Madden K, Najji L, Phillips M, *et al.* The “Infodemic” of journal publication associated with the novel coronavirus disease. *J Bone Joint Surg Am* 2020;102:e64.
8. United Nations. UN tackles ‘infodemic’ of misinformation and cybercrime in COVID-19 crisis. United Nations. United Nations; [Last cited on 2020 Oct 20]. Available from: <https://www.un.org/en/un-coronavirus-communications-team/un-tackling-%E2%80%98infodemic%E2%80%99-misinformation-and-cybercrime-covid-19>.
9. Palayew A, Norgaard O, Safreed-Harmon K, Andersen TH, Rasmussen LN, Lazarus JV. Pandemic publishing poses a new COVID-19 challenge. *Nat Hum Behav* 2020;4:666-9.
10. Huisman J, Smits J. Duration and quality of the peer review process: The author’s perspective. *Scientometrics* 2017;113:633-50.
11. A parallel pandemic: The crush of covid-19 publications tests the capacity of scientific publishing - The BMJ. [Last cited on 2020 Oct 14]. Available from: <https://blogs.bmj.com/bmj/2020/05/26/a-parallel-pandemic-the-crush-of-covid-19-publications-tests-the-capacity-of-scientific-publishing/>.
12. Himmelstein D. The history of publishing delays. [Last cited on 2020 Oct 15]. Available from: <https://blog.dhimmel.com/history-of-delays/>.
13. Asaad M, Rajesh A, Banuelos J, Vyas KS, Tran NV. Time from submission to publication in plastic surgery journals: The story of accepted manuscripts. *J Plast Reconstr Aesthet Surg* 2020;73:383-90.
14. Stamm T, Meyer U, Wiesmann HP, Kleinheinz J, Cehreli M, Cehreli ZC. A retrospective analysis of submissions, acceptance rate, open peer review operations, and prepublication bias of the multidisciplinary open access journal *Head & Face Medicine*. *Head Face Med* 2007;3:27.
15. Chen H, Chen CH, Jhanji V. Publication times, impact factors, and advance online publication in ophthalmology journals. *Ophthalmology* 2013;120:1697-701.
16. Shah A, Sherighar SG, Bhat A. Publication speed and advanced online publication: Are biomedical Indian journals slow? *Perspect Clin Res* 2016;7:40-4.
17. Björk BC, Solomon D. The publishing delay in scholarly peer-reviewed journals. *J Informetr* 2013;7:914–23.
18. Talley NJ. SARS-CoV-2, the medical profession, ventilator beds, and mortality predictions: Personal reflections of an Australian clinician. *Med J Aust* 2020;212:302-3.
19. Eisen MB, Akhmanova A, Behrens TE, Weigel D. Publishing in the time of COVID-19. *Elife* 2020;9:e57162.
20. Gasparyan AY, Yessirkepov M, Duisenova A, Trukhachev VI, Kostyukova EI, Kitas GD. Researcher and author impact metrics: Variety, value, and context. *J Korean Med Sci* 2018;33:e139.
21. Doja A, Eady K, Horsley T, Bould MD, Victor JC, Sampson M. The h-index in medical education: An analysis of medical education journal editorial boards. *BMC Med Educ* 2014;14:251.
22. Ioannidis JPA. Coronavirus disease 2019: The harms of exaggerated information and non-evidence-based measures. *Eur J Clin Invest* 2020;50:e13222.
23. Yeo-Teh NSL, Tang BL. An alarming retraction rate for scientific publications on Coronavirus Disease 2019 (COVID-19). *Account Res* 2021;28:47-53.
24. Björk BC, Solomon D. Article processing charges in OA journals: Relationship between price and quality. *Scientometrics* 2015;103:373–8.