EDITORIAL

Review-reviewer-reviewed (7-8-9): A review of peer review

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The year 2023 has witnessed more than 10000 retractions of research articles for this year, which is the highest among recent years.[1] This is not an incidental fact, there was a continuous rise in retractions worldwide with around 4000 retractions for 2021 and 2022. This sudden big stride in the retractions is because of the contribution of a big publication house in its effort to clean some of the 'large-scale systematic manipulation.[2] An estimated 70000 research articles are published as 'paper-mill' products in 2022.[3] Retraction is only one possible step publication houses can take, but it is not easy to filter out 400000 articles already commingled with the estimable articles.[3] While retraction is good effort but the harms already done by these articles are not easy to repair. Allaround efforts are needed to restrict these 'dark publications' from fouling the ethical science publications.

Publication of a journal is believed to serve the community with the dissemination of newly acquired information or knowledge and archiving the same to record the evolution of knowledge. With this intention, the journals used to be published by the learned bodies. With time, the publication of journals became a business of academic information. Various models of publication came into existence and maybe more will be coming as online and digital publications are willing to experiment with publication processes to provide the audience or customers more and more ease of access and other benefits. A good number of callbacks, retractions, and index delisting in recent years indicate that there are some flaws in the system.

Published materials always have a greater impact on society because of their visibility (repeated, if required), on-demand accessibility, and durability (hard copy); therefore, credibility and accountability of the same became essential. The concept of content evaluation before publication was introduced to honor these criteria. The responsibility was well catered by the publication houses and slowly society and readers categorized the publications as per their choices and grades of credibility were associated with the names of specific publication houses. To prove the credibility of their writings, authors also show interest in publishing their contents with the publication houses of higher credibility. With more workloads of evaluation, the need for a robust system of evaluation was felt and to support that a panel of examiners was needed whose level of expertise in the field must be of equivalent level, if not more. With a sense of responsibility, experts in the field and other knowledgeable individuals came forward to help the publication houses and to support the authentic growth of knowledge. Strong influences of the evaluation process were observed in making their choices and the eventual growth of the publication houses implementing these systems. The concept of peer review crawled into the system of evaluation to increase the acceptability of published materials in society.

This evaluation process has further evolved into professionalism. Most professions have identified sets of skills or competencies that must be acquired to be licensed in that profession. The evaluation of acquired competencies is done by the peers or seniors. The process, if used properly, confirms the quality assurance of the professionals themselves or the service provided by these professionals. Normally, a regulatory body conducts this review process to evaluate and document the professional efficiency, technical knowledge, ethical adherence, and deliverable competencies for the skills to be certified along with other regulatory attributes as decided from time to time. The quality and professionalism of the evaluators are of utmost importance in the process, as that ensures the stability, continuation, and required upgradation of the process with confirmation of the service provided by the system. The whole process runs with an assumption that all the stakeholders are discharging their duties and responsibilities with proper ethical and professional obligations only. The peer review or the evaluation process in all parts of the professional accreditation carries associated benefits to the evaluator directly or indirectly. This is not true for the peer review process in scientific journals except some incentives.[4] Therefore, dilution of the system and its credibility are happening by infiltration of ethically weak, scientifically unsound peers replacing disinterested, otherwise busy experts in the field.

The pre-publication evaluation process, the peer review,[5] is not as robust as it appears for some authors. As a scientist, part of the system, it is an obligation to review the upcoming scientific publications. On the other hand, scientists also need to look into other obligations like academic (research, teaching, training, conference, publications, etc.), administrative (laboratory, departmental, institutional, state-level, national, international, etc.), financial management (project, funding, auditing, etc.), associations, regulatory bodies, etc. on a priority basis. Amidst these multi-dimensional and strenuous but unavoidable involvements, it is tough to find time and interest for the peer-review process. It is undeniable that there is some degree of deterioration in the system of peer review process and that is not surely unidimensional. When explored systematically, several problems contributing to different strata can be identified which has significantly weakened the process.

Here I state a few problems associated with the peer review process:

1. *Publication of journals by non-peers*. If the publication system of a journal is managed by experts in some other fields, there is a chance that the flaws, if any, in the peer review process remain unnoticed and that the scientific credibility of the journal is compromised. However, this may not always be true; the problem can be overcome by engaging proper peers in the process.
2. *Limited scope*. While all the participants of the peer review system are willing to adhere to all the known scientific and ethical standards, it cannot be guaranteed that the publication is the most accurate one. There is always the possibility of some inadvertent errors in the system.
3. *Non-availability of suitable reviewers*. As many journals are being published with the same or similar specialties, it is obvious there will be a dearth of interested experts in the field who will serve the peer review process with an obligation to the scientific cause.
4. *Nonbinding of journals to ethical standards*. In some cases, even with the availabilities of experts, the journal system would like to opt for the (so-called) experts for the peer review so that the process can be mended and not face the regularly expected obstacles, often commercial.
5. *Compromised review*. Because of a lack of time bound by obligation or nonacceptance of self-limitation or irritation by reminders or something other, the review process can be compromised at the level of the reviewers themselves.
6. *Lack of recognition for reviewers*. Investment of time, energy, and scientific intellect for a publication by an unknown author may not be that worthy in this highly competitive epoch of science. While blinding certainly brings credibility to the system, the same process eludes recognition of the potential contribution from fellow scientists.
7. *Predefined results*. Inclination towards acceptance of positive results or repudiating the publication of negative results is a common tendency of the scientific community. This is further endorsed by the peer review system.

Problems also exist with the reviewing of manuscripts by peers:

1. *Inadequacy of expertise*. This is the time of superspecializations and extreme interdisciplinary collaborations. Studies are being carried out in evolving areas where the identification of true experts in the field is next to impossible.
2. *Anonymity issue*. Expert peers may face a lack of motivation to participate in the review process because their contributions will remain unrecognized even by the authors. This may lead to unconstructive and unprofessional feedback regarding a manuscript. However, reviewing by names is allowed by some journals, others may argue that it might raise the chances of bias.
3. *Unacceptability of school difference*. Science sometimes may face the dilemma of differences between school of thoughts. In the case of school differences between the authors and reviewers, the chances of domination of reviewers' biases and subjectivities in the review process are very high.
4. *Conformity to system*. Reviewers may also face the compulsion to follow existing norms or established forms of scientific reporting. There is a chance that the review process can deject the unconventional thoughts with novel ideas.
5. *Type I and II errors*. There is a high possibility of false-positive and false-negative impressions about the information being reviewed depending on the pre-conceived ideas about the source of the manuscript whether indicated by the writing style or presentation style or otherwise conceived by the peer reviewer.
6. *Inter-peer inconsistency*. Depending on the perception of the individual reviewer, there could be some differences in the appraisal tiers of the same manuscript. These individual variations could lead to inconsistency in the process.
7. *Conflict of interests*. Adhering to the ethical guidelines, reviewers are supposed to disclose all the possible conflicts of interest. However, potential conflicts could remain unidentified with blinding systems. Therefore, the outcome of the review process could be prejudiced by intentional or unintentional influences of the recruited peers.
8. *Proxy reviewers*. As the established experts face time constraints, there is the possibility that that review is done by their assistants or students with a motto of learning-teaching the procedures of reviewing. However, there is always a chance of unintentional compromise or over-enthusiastic hyper-evaluation of the manuscript.

Additionally, many issues of peer review cause problems for authors:

1. *Time*. The peer review process is believed to be a time-consuming one. It is hard to understand why an expert needs weeks or months to go through a single manuscript. Before the evolvement of the digital communication system, communication between international experts through surface mail had taken months causing delays in the process, and the tradition of delay is continuing. Some journals provide a fast review process, which is even so fast that it is hard to believe that the process has taken place. Some journals take only justified time to run the process.
2. *Lack of scope for two-way discussion*. Authors may have limited opportunities for direct communication with reviewers, making it difficult to seek clarification on specific points or discuss the rationale behind certain feedback. On the other hand, some online platforms

of publication have introduced the review process that includes the direct discussion between the author and the reviewer. However, influences of comments and other reviewers can influence the review process.

3. *Language*. English is the commonest language of scientific publications. Presentation of the scientific contents in a manuscript is always a challenge for non-English speaking authors. It appears comments regarding language problems are often identified by the editorial office when the publication house also offers a language editing service. The concern of plagiarism also complicated the situation.
4. *Hesitance*. Presentations of novel or unconventional ideas are hardly encouraged by the current system of peer review. At the same time, there are multiple factors before choosing a journal for the communication of a manuscript including suitability of field, scope, impact factor, indexation, publication frequency, processing time, processing and publication fees, and earlier publication experiences contribute highly to the hesitance of the author before communicating any manuscript. Apprehension about the review process further heightened the hesitance.
5. *Dilemma in selecting reviewers*. When the journal asks to propose the names of probable reviewers, authors face a dilemma about proposing a particular group of reviewers. Commonly, highly ambitious newcomers in the field would like to get their manuscripts evaluated by renowned experts in the field. However, that may happen with a risk of high chance of rejection. Additionally, the lack of diversity in the available pool of experts and the unwillingness of a chosen reviewer may have a negative impact on the decision of the manuscript.
6. *Predicament of data presentation*. The sense of completeness of a scientific concept may have individual bias. This sense may vary between the authors and the reviewers in terms of supporting data. While authors do not want to waste their data within limited publications, they also are afraid of being blamed for salami slicing. Authors also sometimes face the predicament of data presentation so that it is liked by the reviewers.
7. *Difficulty in responding to feedback*. As the responses provided by the authors are not necessarily evaluated by the same person (commonly, expert peers are not willing to re-review the revised manuscript) who originally provided the feedback, there are possibilities that responses are being misjudged by a third person.
8. *Pseudo-inferiority complex*. To avoid possible unacceptability of the manuscript, some researchers may feel stressed to align their research with the contemporary inclinations of popular topics. This happens particularly after getting manuscripts rejected repeatedly without detailed feedback or clear explanations.
9. *Pseudo-superiority complex*. In the highly competitive scientific era, authors may be afraid of sharing information with unknown people who have access to the manuscripts with an apprehension of idea theft.

When a manuscript is declined by a highly-rated journal in that field, authors tend to send the same manuscript to a relatively lower-rated journal in the same field and this continues till the manuscript gets a positive response from the journal. In the process, let's assume, the manuscript was declined by three journals (often it is more) before it is published by a journal, on average three scholars from the field, one editor, and two reviewers, have agreed to deny the publication of the content. If the renunciations faced by the manuscript are because of scientific flaws identified by the peer scientists involved in the editorial and review process of rejecting journals, and now if the same manuscript is published by a relatively lower-ranked journal, the sincere efforts of all these scientists are unsuccessful. It is a flaw of the scientific publishing system. With the availability of many journals in the same field, authors of all manuscripts are confident that the manuscript will ultimately be published by some other journal. The only thing is the final journal may have a lower impact factor or not have at all, not included in good indexing services, not have DOI, and even may be a predatory journal, but the authors may console themselves that it is published somewhere and available in the public domain. With browsing, this content is available to everyone and scientific contamination cannot be prevented. Even though some 10-12 sincere members of the community tried their best to restrict the information from being public, the tenacity of another group from the same community could defy the posed restriction as other opportunities were available to them.

Occasionally, editors communicate back to the reviewers with the responses from the authors and about the final decision on the manuscript. If the comments from a reviewer are not addressed and the manuscript is published, reviewers can hardly do anything about it. Thus, the reviewers have a lot of responsibilities without any rights. Similarly, blinded reviewers have only a dubious opportunity to question the scientific or ethical integrity of the contributing authors. Peer review is the linchpin of academic publishing, serving as the gatekeeper that ensures scholarly work meets rigorous standards before reaching the public domain. On the other hand, the peer review has only poor association with any disciplinary or any other regulatory mechanism of the system. Efforts are ongoing to address these issues and improve the peer review system, including the exploration of alternative models such as open peer review, post-publication review, and collaborative review processes. Some journals insist on engaging the reviewers in a one-to-one discussion with the authors. However, the concept of discussion is pre-decided towards conformity where the raised concerns are to be resolved by the authors and the manuscript has to be accepted for publication. Providing clear guidelines to reviewers, encouraging transparency, promoting diversity in the pool of reviewers, and considering alternative models

should be continued to encourage the responsibility of peer review to enhance fairness and quality in the evaluation process.

The peer review process is the modified systematic form of an age-old experience-based evaluation procedure that is accepted by the relevant community. Publication in the scientific arena intends to share the acquired knowledge with the stakeholders of science who can utilize the information for the betterment of the mankind or environment.

Peer review is one of the important pillars of scientific publications meant for the evaluation of written content for its authenticity with transparency.[5,6] Interestingly, the possible 'paper-mill' product is maximum in the 'Medicine and Biology' category;[3] should 'anonymous researchers who volunteer their time and expertise[7] be blamed for this mishappening? While searching online about the peer review process, there are some articles regarding the history,[5,8] processes,[5-7] challenges,[4,5] alternatives,[4,5] etc. are available; however, the composite multidimensional approach of inspection is missing, even with searches by artificial intelligence. This article is an effort to identify the loopholes in the system with the hope that it will contribute in keeping the magnificence of this review process in maintaining the highest (10/10) possible level of credibility of the publication system.

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