Peer Review system: A Golden standard for publications process

Shamima Parvin Lasker PhD (USA), MPH (USA), EMMB (Europe), MPhil (BD), MSc (BD)

Professor & Head of Anatomy, MH Samorita Medical College, Dhaka, Bangladesh
Visiting Professor, Clinical Anatomy, Dentistry, and Bioethics, AUSN, USA.
Sectary General, Bangladesh Bioethics Society.
Treasurer, World Association of Medical Editors (WAME)
Chairperson, Ethics & Publication, Asian Pacific Association of Medical Editors (APAME)
Senior Vice President, Bangladesh Society for Scholarly Journal Editors (BASE)
Executive Editor, Bangladesh Journal of Bioethics

Abstract: Peer review process helps in evaluating and validating of research that is published in the journals. U.S. Office of Research Integrity reported that data fraudulence was found to be involved in 94% cases of misconduct from 228 identified articles between 1994–2012. If fraud in published article are significantly as high as reported, the question arise in mind, were these articles peer reviewed? Another report said that the reviewers failed to detect 16 cases of fabricated article of Jan Hendrick Schon. Superficial peer reviewing process does not reveals suspicion of misconduct. Lack of knowledge of systemic review process not only demolish the academic integrity in publication but also loss the trust of the people of the institution, the nation, and the world. The aim of this review article is to aware stakeholders specially novice reviewers about the peer review system. Beginners will understand how to review an article and they can justify better action choices in dealing with reviewing an article.

Key words: peer review, review system, bioethics, publication ethics

Introduction: "Peer reviewers are the 'gate-keepers' of science" that helps in evaluation and validation of research [1]. Editors, academics and readers have full trust of peer-review system [2]. But sometimes their peer reviewing system raise question [3]. According to report of U.S. Office of Research Integrity, fraud articles were found in 94% cases from 228 published article of misconduct over 15 years period [4]. Jan Hendrick Schon, 31 year-old physicist, while working at Bell Laboratory in Murray Hill, New Jersey, published duplicated, fabricated and falsified article in reputed journal including Science and Nature. Careless review process failed to detect misconduct of 16 articles of Schon [3]. However, a survey on 590 editorial board members of chemistry journals revealed that 97% of the journals were not double-blinded [3]. A research analyzed the effectiveness of peer review process of three journals, namely British Medical Journal, Annals of Internal Medicine and The Lancet. They found that 946 submitted article were rejected among the dataset of 1,008 submitted manuscripts. Among the rejected article 757 manuscripts were resubmitted to another journals for publication. These articles

were cited extensively over time [5]. Peer-reviewed journals were not doing their jobs. The poor quality of peer review significantly reduces the confidence of researchers and clinicians.

Some said peer reviewers take excessive time and delay the publication [3]. In spite of criticisms, peer review is the most conventional technique for quality and validity of individual articles [1]. A survey of Ware and Monkman proposed that of 93% believe the peer review is important and necessary; 85% believed scientific community has been benefited from peer reviewer and 83% thought peer review is the only system to control of misconduct [6] .

Editors belief on peer reviewers for fair assessments of article. Peer reviewers has responsibilities and obligations to review the article and identify all the ethical issues raised by the research [2] . Academic integrity is essential not only for progress within the academy, but also for maintaining the trust of the people as a whole. Utmost awareness is necessary in peer reviewing process especially to the apprentice reviewers. Therefore, this review article has been undertaken so that novice learner can comprehend the whole peer reviewing system and they can able to consider the issues need to be think off during peer reviewing process.

Historical Background: The first identified peer review process was found in 854–931 B.C. in the book of Ishāq ibn ‘Alī al-Ruhāwī entitled “Ethics of the Physician”. According to him, physician kept notes on patient's condition for every visit. When patient “cured or died”, the local medical council scrutinized the records of the physician if the treatment was consistent with the standards of medical care [7,8]. The first documented journal peer-review was seen in 1665 at Philosophical Transactions Journal where an editor requests independently experts from his field for his private use [1]. In 1731, peer review was introduced to scholarly publication of medical articles by the Royal Society of Edinburgh. All these type of peer review were like conference now a day [3]. Till mid-eighteen editor use to act as peer reviewer. In 1750s, Denis Diderot said “A journal embraces such a large variety of matters that it is impossible for a single editor to oversee every issue specially in mediocre journal” [7]. Until World War II, editorial process is not shape what we call peer review process today [3] . Science, Nature and The Journal of the American Medical Association started peer reviewing in mid-20th century [8] . The Lancet did not implement peer-reviewers outside the journal until 1976 [9] .

Definition: Peer review is a process of evolution in order to publish for scholarly community. Peer reviewer is also called referee and articles are called "refereed articles". According to WAME “A peer-reviewed biomedical journal is one that regularly obtains advice on individual manuscripts from reviewers who are not part of the journal’s editorial staff to intend to improve the accuracy, clarity, and completeness of published manuscripts and to help editors to decide to publish [10].

Peer review is the “golden standard” for evaluating the publications [11]. Editors request at least two reviewers to evaluate a manuscript. Sometimes journals call an additional reviews. Additional peer reviewer is needed for cross

disciplines, statistical analyses, complex, controversy or strong disagreement work for thorough evaluation of a paper [12] .

Types of peer review: Many types of peer reviewing system has been recognized. Each model has pros and cons [12] . But it is not clear which system is the best [12] . Different disciplines use different model of peer review system according their benefits and feasibility [2] . Different types of peer review system has been shown in Table 1.

Table 1. Different types of peer review system

Type	Definition	Prons	Cons	Reference
Single blind peer review	Only reviewers aware of the identities of authors.	Reviewers are not influenced by the authors, protecting against possible reprisals by author.	Highly subjective, Possibility to bias review in favor of or against the author. Delay the review. In case of competitor may take advantage of ideas of article yet unpublished.	CSE, 2012[12]
Double-blind peer review	Both the reviewers and authors are not aware of each other identities.	Reduce biasness, prevent unreasonably critical in case of the competitors work. e.g. most of the journals	Delay the review. Sometimes superficial review of an article.	CSE, 2012[12]
Open peer review	Both the reviewers authors are aware each other identities	More transparent, rapid and better quality of reviews. Reviewers comments are openly available with reviewers name in published article.	Reviewers may be less willing to review, less critical and impartial, if their identity is revealed, particularly when judging their colleagues' work	CSE, 2012[12]

Transparent peer review	Similar to open peer review.	Similar advantage	Similar disadvantage. However, the reviewer's names are not available in the article.	COPE, 2017[13]
Interactive or collaborative peer review	Peer review usually takes place on a platform, reviewers can interact with authors or each other	Facilitate the review process. Review process occur through over phone, Skype etc.	Can make reprisals or reviewers may be less critical and impartial.	CSE, 2012[12]
Multi-stage open peer review	Reviewers plus other members of the scientific community can openly discuss for a designated period of time and openly comments.	The manuscript is then revised, edited (re-reviewed if needed) and finally published. Very rapid publication. e.g. Atmospheric Chemistry and Physics	Identity of reviewers' names can make hostility or reviewers may be less critical and impartial.	Pöschl, 2012[14]
Cascading or shared peer review	When manuscripts rejected after review, article can transfer among sister journals in the same publisher.	No need to reformat and further peer review. e.g. SAGE journals: Otolaryngology Head and Neck Surgery and OTO Open; JAMA family of journals; Elsavier etc.	Rejected article is accepted anyhow	

post-publication peer review	Usually anonymous, blogs, and social media comments e.g. letters to the editor, journal online comments, editorial comments, third party website commenting such as PubMed Commons and PubPeer.	Take long time to publish. Traditional print-based journals generally batch letters to the editor and request a response from the authors, publishing them together in a single issue a few months after the original article.	Only letters to the editor are indexed.	COPE, 2017[13]

Process of peer review: Peer review is a well-known professional practice in scholarly publication [15]. After completion of research, article is submitted to a journal. Editors send the article to the reviewers in the same field. Reviewers provide feedback on the article. Authors address the article according to reviewer's comments and submit it for publication. Editor take the final decision whether article is accepted or rejected for publication. Only the articles based on objectives, well-structured methodology, logical reasoning and argument with evidence etc are accepted for publication [16].

What do reviewers do with manuscript? Each reviewer assesses the article by asking questions. Based on the answers to these questions, the reviewers decide whether the article is worthy to publication. They then make a recommendation to the editor whether article can be approved or rejected. Questions are like:

1. What is this research about?
2. Is it interesting?
3. Is it important in existing knowledge?
4. Does the paper fit the scope of the journal?
5. Is the research question clear?
6. Is the approach appropriate?
7. Does it develop novel concepts?
8. Are the study design, methods and analysis appropriate to the research question?
9. Are the methods of statistical analysis and level of significance appropriate?
10. Are the findings original?

11. Is the methodology sound?
12. Are the conclusions logical?
13. In case of research with human or animals, was ethics approval gained?
14. Is the article duplication publication?
15. It is plagiarized?

Role and responsibility of peer reviewer: Peer should follow some norms and values to be a reviewers. Following are some universally accepted responsibilities of reviewers for sound peer review outcome [12].

1. Timeliness and responsiveness: Provide scholarly and unbiased feedback in a timely manner. Reviewers should promptly decline when they cannot meet the deadline.
2. Competency: Reviewers should be the expertise in the field of article. Without expertise reviewer may recommend an article with considerable insufficiencies or reject the worthy paper. In such cases, the reviewer should decline to review.
3. Financial conflict: Reviewer should disclose the conflict of interest if any. In this case reviewer should decline to review.
4. Impartiality: Reviewer comments and recommendation should be based on article objectives and scientific merits in regard to nation, creed, race, color, ethnic origin, sex and religion.
5. Comply with: Comply with the editor's instructions. Identify if the writing is clear, abridged, scientifically accurate, original and appropriate to the journal. Determining scientific merit, and indicating ways to improve it.
6. Constructive critique: Reviewer should assess the manuscript in sympathetic and positive way, providing unbiased and enlightening critique to the submitted work, identifying negative aspects constructively and avoiding personal comments or criticism.
7. Ethical approval: Noting any ethical violation during research with animal or human.
8. Duplicate publication: Alert editor in case of any knowledge of similar article to prevent duplicate publication
9. Confidentiality: Reviewer should not share or disclose information with third parties, from the reviewed paper.
10. Material handing: Reviewers should not keep copies of submitted manuscripts and should not use the knowledge of their content for any purpose other than the peer review and destroy the manuscripts after reviewing finish.
11. Contact to author: Reviewers should refraining from direct communication to author.

Reviewer's misconduct: Peer review does not guarantee manuscript quality and does not reliably detect scientific misconduct" [10].

Reviewer misconduct may include

1. Falsifying the facts in a review [12].
2. Unnecessary delaying the review process; most journals request reviews within one to three weeks[12].

3. Unfairly criticizing on a competitor's work [12].
4. Proposing changes according to and support the reviewer's own work or hypotheses [12].
5. Use of manuscript content for one's own benefit, plagiarism of manuscript content, intellectual property theft during peer review [2].
6. Sharing manuscript content without permission,
7. Not disclose one's conflict(s) of interest.
8. The reviewer does not destroy the manuscript in paper or electronic form after review process. Keep it for later use. Use the manuscript or information obtained from it for personal gain (be it professional, personal, or financial) [17].

Reviewer Selection: Editor should invite reviewers who expertise in the same field of article [12]. Editors should avoid rude, defamatory peer reviewer. Editors should avoid using reviewers who provide poor quality reviews and/or are very tardy in submitting their reviews [17]. Editors should screen out reviewers for potential conflicts of interest. Editors should not make reviewers from the same institution, least not in the same department of the authors. Editors generally should avoid asking reviewers to review more than a couple of times per year, unless the reviewer has agreed to review more often (e.g., as an Editorial Board member) or there are unique circumstances the editor discusses with the reviewer [10]. Editors may select peer reviewers according to author's suggestion but not accept the blinding system [2.] If editor is requested by the author not be used certain reviewer, editors should consider the requests if justified [10].

Time requires for peer review: "Peer review and publication system are time-consuming process, frequently involving more than a year between submission and publication"[2]. Reviewers should be reminded as the deadline draws near and when it is reached or overdue, if reviewers do not return reviews in a timely fashion and do not respond to reminders, the editor should contact another reviewer. The author should be informed of the reason for the delay. If the manuscript already has two peer reviews, the editor should assess the manuscript (or ask another editor with the journal who specializes in the area to assess it) to determine if the existing peer reviews are sufficient to make a decision [17].

Review quality: Peer review process should be fair and minimize bias [2]. When the editor receives the peer reviews, the editor should consider whether the reviewers' comments are constructive and whether the reviewer provides specific examples from the manuscript to support the comments. For example, "This study was poorly designed and executed, and such shoddy work should not be published," the reviewer should provide specific examples of why the study design is not well suited to answer the study question and the problems that may result.

Several types of comments are not appropriate for a review. First, the reviewer should not address the manuscript's suitability for publication in comments for the author; if the journal permits comments for the editor, the

reviewer can make recommendations there. The decision to publish is the editor's; the reviewer's role is to evaluate and explain the study's strengths and weaknesses. Second, reviewers should not ask authors to preferentially cite their work unless the citation is truly justified. Third, reviews that are insulting or demeaning with no useful comments should not be sent to the author. If a review is useful but includes comments that are not constructive, the editor should modify those comments before sending to the author, and share the modified comments with the reviewer.

Editors should thank reviewers when they complete their review and, in due course, inform reviewers of the manuscript decision and provide them with the other reviewers' comments [17].

Rewarding Reviewers: Some journals published list of reviewers in order to recognize the reviewer's generous volunteer efforts with thanks publicly [18]. Editors may include them in Publons, a free review reporting services[18]. Some journals reward reviewers who have provided several high quality reviews by publishing their names as distinguished reviewers; star reviewers and awarding them a certificate and/or letter signed by the editor and journal owner (head of the academic institution or professional organization [17]. Journals may include reviews in the continuing medical education credits [12]. Other incentives include free journal subscriptions, complementary access to databases (or for a limited time during the review period) and waived submission or article processing fees for reviewers who submit future research as authors [17]

Discussion:

Biasness: Value of the journal is depend on the peer review process. Some cases, especially in quantitative research, biasness is discernable as the direct violation of impartiality underdetermining the criteria of peer review system during evaluation process [15]. Reviewers should not assess the article on the basis of "sense of self and relative position" but its rational content [19]. Sometimes, biasness may be occur due to social characteristics of the author/reviewer e.g. prestige bias, nationality bias and language bias [15].

Limitation: Sometimes, peer review takes too much time and delay publishing substantially. "It's one of the bottle necks of scholarly publishing" [2]. Sometimes, number of experts in same arena are limited to review. Reviewer is not paid as job. They are occupied by other academic tasks that delay the peer reviewing process [2] .

Payment: Timothy McTighe, Executive Director of JISRF and Editor-in-Chief of Reconstructive Review, in his personal letter in the WAME blog think that reviewer should not be paid. Reviewer cannot pay at the same rate that his job pays him. It comes very close to a conflict of interest. If the payment is made to expedite the review process the reviewer might be tempted to accept the submission believing he will get more paid request for review. It also clouds the overall merit of the quality of content [20]. He also argue that if there is merit in the journal content there should be enough quality experts willing to review manuscripts as part of their overall professional goals of keeping their standards high in their chosen profession [20]. Payment may bring about

suspicion and doubt about the peer review process [20]. Some cases, statistician may be paid for their services to review the article, but most peer reviewers are not paid because they will receive the same service when their manuscripts are under review [17].

Review Process: It is believed that the double-blind review system is better than single-blind as it is less biased but there is also doubt whether true blinding is really possible [15]. As for example, Israel is a small country, double blinding process is really useless as everyone of scholar society knows each other and knows what research is going on in which institute [3]. Sometimes authors can be easily identifiable by the reviewers through their writing style, subject matter and self-citation [1]. A research shown that after masking the authors' identity, of 30% of the authors were identified by the reviewer due to self-citation [3]. In small research fields this number is higher. Double blinding is pointless because the content and references could not be truly masked [3]. However, a report says, most of the people prefer still double blinding (56%) than single blinding (25%) [6].

Some consider open review system is the best way to prevent plagiarism, malevolent comments and stop reviewers from implement their own agenda. Others realize it is a less effective process, reviewer may withhold or tone down criticism in fear of retribution [1] .

In case of transparent peer review, comments are posted on the journal website may appear at any time and generally are not indexed. Authors should be encouraged to respond to them as appropriate. Authors of letters to the editor and authors of online comments both should be required to disclose their conflicts of interest in adherence with the journal's policies and the conflicts should be published alongside their comments. The journal article should link to the journal's related post-publication peer review, and vice versa. Journals may wish to link out to non-journal post-publication peer review [17]. In case of cascading, same manuscript need not to review again for different journals of parent journal. If articles are rejected authors can transfer article to another journal of same family without reformatting. It save time to author as well as editors [1].

Whatever the mode of peer review process, it does not guarantee manuscript quality and does not reliably detect scientific misconduct" [10].

Editorial Support to peer reviewers: Peer reviewers should be protected from authors when peer reviewer's identity are revealed. Editor should write authors explicitly discouraging to contact peer reviewers directly, especially if misconduct is suspected [2] .

Authors Appeals: "Authors have the right to appeal editorial decisions". Journals should have a policy and clearly mention in the journal's instructions that authors can appeal of peer reviewer's decisions. This may be benefitted for both authors and editors but editor should careful and discourage repeated or groundless appeals [12].

Publisher: To increase the standard of peer review system, publishers can audit the

percentage of accepting and rejecting peer reviewed papers annually and asses how journal's reporting standards can be increased. Publishers can collaborate with Software Company to create a meta-researchers /peer reviewer that may help editors to compare the peer and review processes [21]. Like the plagiarism checker, technology may develop a software to identify illegitimate declaration of peer review journals can be detected [21]. Publishers should undertake to develop review metrics (e.g., number, role of reviewers and review commentary) along with journal metadata to increase the quality and legitimacy review system of article [21].

Conclusion: Peer review system was deployed date back 7th century, in medical profession to scrutinize treatment was consistent with the standards of medical care. Until World War II, peer review process is not shape like today. The peer review is the key process to evaluate and validate the research that increase the overall quality of the journal.. Superficial and poor quality peer reviewing process does not identify the misconduct and ethical issues raised by the research. Peer review system is the gold standard to review an article. There is no system develop above peer review process for academic integrity. Lack of systemic knowledge of review process abolish the academic integrity in publication and trust of the academics and readers. I belief this document will make aware the stakeholders about the peer review process.

Reference:

1. Elsevier 2016. What is peer review? https://www.elsevier.com/reviewers/what-is-peer-review (Accessed on Feb 2017).

2. Chris, G., Elizabeth, W., Alyson, B., Suzan, F., Diane, Andrew, R. Best Practice Guidelines on Publication Ethics: a Publisher's Perspective Journal compilation. J Clin Pract. 2007; 61(Suppl.152): 1-26.

3. Hadas S. The Birth of Modern Peer Review. Retrieved from: https://blogs.scientificamerican.com/information-culture/the-birth-of-modern-peer-review/ (Accessed on Feb 2017).

4. Steen RG, Casadevall A, Fang FC. Why Has the Number of Scientific Retractions Increased? Plos One 2013; 8 (7): 1-9.

5. Silera K, Leeb K. & Beroc L. Measuring the effectiveness of scientific gatekeeping. PNAS. 112(2): 360–365.

6. Ware, M. & Monkman, M. Peer review in scholarly journals: Perspective of the scholarly community — an international study. Publishing Research Consortium. 2008. Retrieved from http:// www.publishingresearch.net/documents/PRCsummary4Warefinal.pdf

7. Wikipedia. Peer review Retrieved from: https://en.wikipedia.org/wiki/Peer_review (Accessed on Feb 2017)

8. Spier, R. The history of the peer-review process. Trends in Biotechnology. 2002; 20(8): 357-358.

9. Benos DJ, Bashari E, Chaves JM, et al. The ups and downs of peer review. Advances in physiology education. 2007; 31(2): 145-152.

10. WAME. Definition of a Peer-Reviewed Journal. Retrieved from: http://www.wame.org/policy-statements#Definition%20PR (Accessed on June 12, 2017).

11. Kelley DM. 2012. Peer Review: Publication's Gold Standard. J Adv Pract Oncol, 3 (2) :117-121.

12. Council Science Editors. CSE's White Paper on Promoting Integrity in Scientific Journal Publications, 2012 Update. Editorial Policy Committee (2011-2012). Retrieved from: www.CouncilScienceEditors.org (Accessed on January 20, 2017).

13. COPE. COPE discussion document: Who "owns"

peer reviews? COPE Council, 2017. Retrieved from: https://publicationethics.org/files/Who_owns_peer_reviews_discussion_document.pdf?platform=hootsuite (Accessed on Feb 2017).

14. Pöschl, U. Multi-Stage Open Peer Review: Scientific Evaluation Integrating the Strengths of Traditional Peer Review with the Virtues of Transparency and Self-Regulation. Frontiers in Computational Neuroscience. 2012; 6:33.

15. Lee CJ, Sugimoto CR, Guo Z, and Blaise C. Bias in Peer Review. Advances in Information Science Journal. 2013; 64(1):2–17,

16. Underrstanding science. 2017. Scrutinizing science: Peer review. http://undsci.berkeley.edu/article/0_0_0/sciencetoolkit_01(Access Feb 2017)

17. Lapeña Jr JF and Winker M. 2017 Peer Review, Manuscript Decisions, and Author Correspondence. WAME eLearning Program. (In Press).

18. Van Noorden, R. The Scientists Who Get Credit for Peer Review. Nature. 2014. Q &A. https://www.nature.com/news/the-scientists-who-get-credit-for-peer-review-1.16102 (Access Feb 2017).

19. Beatriz B, Ricardo C, Konrad, Martin T. Bias in peer review: a case study. *F1000Research* 2015, 4:21. 10.12688/f1000research.6012.1 (Access Feb 2017)

20. McTighe T. JISRF and Editor-in-Chief. Reconstructive Review. Retrieved from: www.JISRF.org (Accessed on Feb 2017).

21. Lee CJ and Moher D. 2017 Promote scientific integrity via journal peer review data: Publishers must invest, and manage risk. Science. 2017; 357(6348): 256-257.

Author's contribution: Author conceived the idea, perceived the knowledge, and drafted the manuscript.

Conflict of interest: None