



Reviewer's Checklists for Evaluating Scientific Manuscripts

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Introduction

Peer review is a critical step in the process of publication of a scientific manuscript. The aim of reviewing is to evaluate the quality of a manuscript on various aspects and to make a recommendation to the editor for publication in the concerned journal. A good review considerably increases the quality of a manuscript and is beneficial for the reviewer and the author in creating future manuscripts.

While searching for reviewers, the editors tend to pick those who have accepted most invites as well as those who have completed most reviews, since these data are available in the database. It is difficult to predict a high quality reviewer based on the qualifications, training and experience [1]. Being invited as a reviewer is a recognition of expertise in that particular field.

It has been found that spending more than three hours in reviewing a manuscript did not increase the quality of a review but the quality improved with increasing time spent up to 3 h [2]. Younger reviewers up to the age of 60 years, training in statistics or epidemiology and current research investigator were significantly associated with good review quality according to assessments by editors [2].

The role of a reviewer starts when he/she receives an email from the editor inviting to review a manuscript. The information provided to them would be the title of the

manuscript and the abstract. The reviewers have to make a decision to review or not based on this information depending on whether it falls within the remits of their area of specialization and expertise. It is advisable to accept or decline the invitation as soon as possible as it will give an opportunity to refer to other reviewers early and saves time for the editors and the authors. Since the publication by Atul Gawande on checklists in surgery and adopted by WHO in preoperative checks in operation theatres, their use has been established and growing in medicine [3, 4]. While there are exhaustive lists for assessing each type of article, we aim to provide useful basic checklists for reviewers while evaluating manuscripts and formulating their reviews.

What Should the Reviewers Equip Themselves with Before Accepting a Manuscript?

1. Scope of the journal
2. Basic working knowledge of the subject being reviewed
3. Good English and grammar
4. Knowledge of what information goes into each section of a manuscript. (Introduction, Materials and methods, Results, Discussion, Conclusions and References)
5. Awareness of author instructions with reference to
 - a. Tables (should be less than 7 combined with figures for IJO)
 - b. Figures
 - c. Word count
 - d. Format of references cited in text as well as bibliography
6. Duration available for review
7. Making note of the format of manuscripts that are submitted to the journal helps
8. Making sure the expertise of the reviewer in the database is updated to avoid manuscripts from unrelated specialities.

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During Review

Perform a basic scan of the above aspects of the manuscript. Tables 1 and 2 will aid in the basic review process of scientific manuscripts.

The colour coding of the tables would give an idea regarding the decision to accept or reject a manuscript. If the manuscript predominantly scores green shades (from Tables 1 and 2) on most issues mentioned, then the manuscript is probably good to be accepted provided major or minor revisions are not required. This objective tool will also help in rejecting a manuscript that is unsuitable when the manuscript scores red on most issues. Though this is likely to help decision-making, not every manuscript can be judged in green and red shades, some are likely to have grey areas, and herein the reviewer will be required to exercise discretion. Similarly, a checklist to review statistics of a paper may be used. How to present statistics in a paper has been given by previous publications [5–7].

The following is a summary of the most important Dos and Don'ts during reviewing.

Dos

- Respond early to invite (remember somebody else is waiting to review and learn if invited)
- Submit review in time
- Be courteous to authors and address politely and constructively while criticizing
- Assess each part of the manuscript and analyze them separately if possible. Identify exact location of the issue being raised.
- Have a plan on how to assess each type of manuscript
- Look up literature/do a PubMed search to see what's new on the topic
- Editors feel favourably towards a reviewer when decision is submitted before time
- Assessing grammar and spelling is not mandatory but may be a bonus
- Give an honest opinion on the manuscript
- Decline from reviewing when there is a conflict of interest
- Be aware of guidelines on reporting certain types of manuscripts
- Back your decision with points that justify the decision made.
- Not everybody is an expert in statistics. So basic knowledge is adequate to start reviewing.

Don'ts

- Give decision without reviewing.
- Single sentence comments on manuscripts.
- Paste the same message to editor and author.
- Delay submission of decision.
- Discuss manuscript outside since it is a confidential document.
- Letter to Editor on same manuscript after review will not be encouraged by editor as those points should have been dealt during review process.
- Hide the fact if the research or researcher is known as it will not form a blinded review.
- Avoid advising authors on how to improve grammar.
- Do not solicit citation of own articles but may be pointed if work is important.
- Do not force authors to cite particular journal but may be pointed if work is important and left out.

Reviewing a Revised Manuscript

This is usually quick since the manuscript has been reviewed once before and only the responses by the authors need to be checked along with corrections made. Hence, the time given for reviewing a revised manuscript is usually a week by most journals.

1. Read all the inputs from other reviewers and the responses given by the authors to the reviewers.
2. Have the authors addressed all the issues raised by reviewers satisfactorily?
3. If yes, countercheck the changes made by the authors to the manuscript
4. If no, politely give a reminder. The author may have forgotten to resolve some issues.

Editors' Role in Reviewing

1. The editor picks the reviewers who can do a good review of the manuscript. He/she favours those who respond fast, provides good quality reviews on time and is reliable. The above information on reviewers will be available in the database. Experienced reviewers are usually preferred for obvious reasons. If you are early in your career as reviewer, and provide a bad review, you may not be favourably considered for another review. From the editors' point of view, it is valuable time wasted by the reviewer. This delays the editing process. So new reviewers should take this learning opportunity well,

Table 1 Checklist during the initial assessment by the Editor and the Associate Editor (All contents under acceptable and satisfactory are in green colour shading and those under unacceptable and unsatisfactory are in light red colour shading)

	Acceptable and satisfactory	Unacceptable and unsatisfactory
Plagiarism	Similarity check < 20 % Few words but no full sentences or paragraphs from previous citations	Similarity check > 20% Paragraphs from previous citations quoted verbatim
Statement of approval by Ethics committee where appropriate	Provided by authors at the commencement of the methods section of the manuscript (Approval number and details wherein the name of the institute can be identified should be avoided during peer review). Should be mentioned once manuscript accepted for publication.	No approval obtained and no justification given.
Originality of topic	Novel study with no previous study / few studies on the same topic of interest Justification given by authors in the abstract and the introduction of the study regarding gaps in knowledge being addressed by the study	Topic not novel. Multiple previous studies done on the topic including RCTs and meta-analysis of RCTs. Justification for present study not given and if given, not acceptable
Suitability for IJO (Indian Journal of Orthopaedics)	The topic of the manuscript is in alignment with the aims and scope of IJO	Topic is either too sub-specialized or non-aligned with the aims and scope of IJO
Likelihood of Type I error (Result shows significant difference but in reality there is likely to be no difference)	Low Less likely because correction made for multiple comparisons and this was specified in the hypothesis prior to the study	High Highly likely due to overuse of statistical test without Bonferroni correction or alternative corrective measures for multiple comparisons Results based on posthoc comparison and no hypothesis framed prior to the study
Likelihood of Type II Error (Result shows no difference but in reality there is likely to be a true difference)	Low Less likely because sample size was adequate, power of study was adequate and authors had overestimated the sample accounting for loss to follow-up and despite loss to follow-up the power of study was not compromised	High More likely because of Low sample size, Low study power, Large loss to follow-up bias leading to lowering of power of study

Table 2 Checklist for evaluating manuscripts for the reviewers (All contents under acceptable and satisfactory are in green colour shading and those under unacceptable and unsatisfactory are in light red colour shading)

	Satisfactory and acceptable	Unsatisfactory and unacceptable
Introduction		
Aims and objectives	Clearly mentioned Research question is clearly stated	Not mentioned / ambiguous Research question not stated
Need for study	Gaps in knowledge clearly identified and justification given for the requirement of the study	Not mentioned
Primary and secondary outcomes	Clear distinction made between primary and secondary outcomes Outcome of interest is clearly defined and mentioned	No mention of primary and secondary outcomes. Outcome of study not clearly specified
Hypothesis	Clearly stated and indication that it was formulated prior to the commencement of the study	Not mentioned
Methods		
Ethical conduct	Statement regarding approval from Ethics committee etc. present	No
Will the chosen type of study answer the research question	Yes	No
Have accepted guidelines been followed?	Yes RCT: CONSORT Cohort study/case control study/cross sectional observational study: STROBE Diagnostic accuracy study: STARD	No
Methodology		
New technique	Complete description given including intraoperative technique and postoperative rehabilitation	Crucial details missing

Table 2 (continued)

Established technique	Crisp relevant detail	Details not sufficient or too many details given for a standard technique
Sample size and power of study	Authors have reported sample size estimation along with appropriate justification. Sample size calculation should have been done using the primary outcome measure Accepted power of study: 80% Accepted level of significance: 5%	Sample size not reported or methodology states “ sample of convenience”
Outcome	Validated outcomes have been used and appropriate reference provided for validation in the particular condition of interest If outcome is not validated for particular condition but validated for other related condition then it is specified	Non-validated outcome used
Statistical analysis	Clearly mentioned and appropriate use of statistical test for the chosen type of study Data distribution checked by authors and appropriate parametric or non-parametric statistical tests used	Inappropriate statistical test chosen for particular study Data distribution not reported by authors and statistical test used without justification
Results		
Duration of follow-up	Adequate (1-2 years postoperative). Justification given if shorter duration of follow-up along with references	Inadequate and no justification given for shorter follow-up
Demographic details	Clear mention of all relevant demographic details	Crucial demographic information not mentioned
Presentation of data	Parametric data presented as mean and standard deviation Non-parametric data presented as median and interquartile range	Inappropriate and incomplete

Table 2 (continued)

	Risk factors presented as relative risk or odds ratio along with 95% confidence interval Exact p value quoted along with 95% CI values of difference of mean	
Tables	Appropriate	Inappropriate (Either too much information or missing relevant information)
Figures	Appropriate	Inappropriate
Internal validity of results	Sufficient validity present and suitable justification given by authors to reduce various types of bias	Serious flaws in methodology of study and likelihood of various bias
External validity of results	Results are applicable to our usual patients	Limited generalizability of the results due to stringent inclusion and exclusion criteria
Discussion		
Discrimination between statistical significance and clinical significance	Distinction made between the two and authors have quoted references to back their claims of clinical significance of the values. Authors have reported minimal clinically important difference (MCID) values of outcomes	No distinction made between statistical and clinical significance
Clinical relevance of findings	Clearly stated by authors	No mention of the relevance of findings from clinical perspective
Comparison with other studies	Plausible explanation given by authors for disagreements with previous studies	Results of previous studies only paraphrased with no suitable explanation for disagreement with previous studies
Strengths of study	Mentioned and reviewer agrees with them	Not mentioned or reviewer disagrees with the mentioned strengths of study
Limitations of study	Mentioned and reviewer agrees with them	Not mentioned or reviewer finds more limitations that those mentioned by the authors
Conclusion		
Adequate and proportionate	Inference and significance of the manuscript is specified and can be extrapolated	Inference is not clear or not mentioned and conclusion is just a repetition of the results
	based on the results of the study	Conclusion overstates and over interprets the result