The Peer Review Process for Clinical Abstracts and Manuscripts: Helpful Tips from the POSNA Evidence Based Medicine Committee

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Abstract: The review of abstracts and manuscripts for presentation or publication is an important part of the peer-review process. Many clinicians and scientists are often asked to review abstracts and manuscripts with little or no formal training in the process of these reviews. This manuscript stresses the importance of abstract and manuscript review, a recommended process to go through to achieve quality reviews, and how to give constructive feedback to authors in a concise yet complete and unbiased way. Manuscript and abstract review can be time-consuming, but it is an important part of the peer-review process when done in a systematic way.

Introduction

Reviewing abstracts for presentation or manuscripts for publication is a vital role in the peer-review process of research. One should have a dedicated algorithm for reviewing either a manuscript or abstract. The purpose of this review is to give guidelines to scientific reviewers regarding how to successfully provide structured and meaningful feedback when asked to perform reviews for both abstract and manuscript submissions.

Part 1: Abstract Review

When reviewing an abstract, the first step in the process is to analyze the title. The reviewer must keep the title in mind as the abstract is read and see if it accurately captures the message or essence of the paper. Specific sections of the abstract will depend on the intended journal or meeting. In general, one of the first few sentences should state the purpose of the study, along with a very brief introduction of the topic if the word limit permits. The methods section of the abstract should concisely describe the study design, inclusion and exclusion criteria, and the study groups. The reviewer should evaluate the study design and draw conclusions to make sure the methods and purpose of the study align. The results should be clear and straight forward and directly address the purpose of the study. The overarching conclusion in the abstract will be a few sentences at most. The conclusion should be clearly supported by the results section and reflect the statement of purpose for the study.[1]

Although abstracts are not lengthy in the number of words, a reader or reviewer should be able to glean a significant amount of information. If a mismatch between the stated study design and hypothesis is noted, this could either represent a major flaw in the research or could be due to an inability to condense the description of the design in a precise manner. Word or figure limits in the abstract can challenge the authors' ability to clearly state the study purpose, important outcome variables, a brief description of the methods, and a succinct conclusion based on the results.

As a reviewer of an abstract for either a journal or a meeting for a poster or podium presentation, it is important to be consistent and review each abstract with as little bias as possible. Comments or criticism regarding the abstract should be specific, constructive, and objective. As a reviewer, one needs to be honest and assess their knowledge of the subject to ensure that you are qualified to be reviewing the abstract.[2]

Part 2: Manuscript Review

A quality manuscript review requires effort and a detailed approach. It necessitates dedicated time to be set aside. The first step is to briefly review the manuscript and decide on its overall quality. A poorly designed study or one with major flaws does not require a detailed response, but the major flaws need to be pointed out for the author(s). A quality study that will be considered for publication should have detailed comments to help improve or correct minor flaws. Standardized reporting guidelines are available based on the type of study the manuscript covers (Table 1). For example, randomized controlled trials should be checked with the CONSORT (Consolidated Standards of Reporting Trials) flow diagram to ensure the methodology for the study is performed correctly. These guidelines can help a reviewer determine if there are any major, insurmountable flaws in the study design or reporting.

Table 1. Reporting Guidelines by Study Type[3]

Randomized Trial
• Consolidated Standards of Reporting Trials (CONSORT)
Observational Studies
• Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)
Systematic Reviews
• Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)
Diagnostic/Prognostic Studies
• Standards for Reporting of Diagnostic Accuracy (STARD)
• Transparent Reporting of a Multivariable Prediction Model for Individual Prognosis or Diagnosis (TRIPOD)
Quality Improvement
• Standards for Quality Improvement Reporting Excellence (SQUIRE)
Health Economy
• Consolidated Health Economic Evaluation Reporting Standards (CHEERS**)**

Once a brief scan of the article has been done, the reviewer should go through the article thoroughly and take note of various flaws or questions that arise. If there are major failings in the manuscript, take notes of suggestions on how this could be revised for the authors to consider resubmission. If there are minor edits that can improve the overall manuscript, annotate those with specific suggested improvements. Comments and criticism should be specific. They should also be helpful and objective while remaining free of bias and opinion. The goal should be to help improve the manuscripts that can add to the literature on a subject, or to help redirect manuscripts that don't seem ready for publication. Quality reviews provide both the authors and the editorial team with honest, constructive feedback and help provide specific recommendations for improvement.

Structuring the Manuscript Review

First, the reviewer should write a succinct synopsis of the study in three to four sentences. This should include the overall study design, the hypothesis, and the findings. This helps not only the editor, but helps the authors determine if the reviewer captured the essential message of the manuscript.[2] After the synopsis, the reviewer should detail the major and minor flaws in the manuscript in a comprehensive and specific response, giving line numbers or specific paragraphs for the authors' reference.

Major Flaws in a Submitted Manuscript

Major flaws may prevent a manuscript from getting published, but some are potentially correctable. A flaw such as the study design being inappropriate for the stated aim or hypothesis likely renders the manuscript unsalvageable. Other major flaws that likely will prevent a manuscript from being published include the study population is inappropriate for the stated aims, or the sample size is insufficient for reliable statistical analysis.

However, even some major flaws could potentially be addressed in a revision of the manuscript and can be given an opportunity for consideration of publication in the future. If inclusion/exclusion criteria are not included or are poorly defined, that can be clarified in a revision of the manuscript. If there are confounding variables not accounted for in the data analysis, a re-run of the data can be performed. Studies should have a primary outcome variable, but if it is not appropriate for the stated hypothesis or was incorrectly measured/assessed, this can be overcome if the variable is included as a secondary variable or if the data is available to the investigators on secondary review.

Major flaws need to be explicitly pointed out so that the authors may consider the chance to restructure their study for resubmission or revision. If there are major methodological issues with a study and manuscript, it is not ultimately necessary to go into details about other minor flaws in the manuscript, but it is important to provide the authors clear and concise feedback about the flaws that need to be addressed with the manuscript.

Minor flaws in a Submitted Manuscript

In general, minor issues or flaws in a submitted research manuscript are those that could be easily addressed by the authors in a revision of the manuscript. These flaws are typically errors, oversight, or lack of clarity that occur during drafting of the manuscript rather than a flaw or error of the study design itself. A significant goal of providing detailed feedback on minor issues is to enhance the clarity of the study for the general reader, which includes providing all relevant methodology and data to allow the study to be reproduced.[2] Allowing others to reproduce research and refute or confirm findings is an integral part of the scientific method. A helpful approach for a reviewer is to ask the question, "What clarification or additional information would be needed for me to replicate this study at my institution?", as one reviews the manuscript.

Specific Components of the Manuscript to Assess

An overall assessment of the length of the article is a key component of a review, as a manuscript should provide adequate detail without extraneous information.[1]

Attention to the appropriateness of the title is another important assessment: does the title of the manuscript accurately describe the message or findings of the article? One must determine whether the key sections and elements of a scientific paper are included. A helpful checklist adapted from Brown et al.[3] is demonstrated in Table 2.

A well-written introduction will leave the reader with a clear understanding of the scope of the problem and a compelling justification for the need for the present study. In a concise manner the authors should describe the background of the subject, a brief synopsis of what research has been conducted by other authors, and what the gaps in knowledge are that require the present study to be performed. In many cases, this can be done in three or less paragraphs.[4, 5] The final section of the introduction should clearly state the aim(s) of the study and/or the hypothesis(es) to be tested. If these are not clear and obvious to the reviewer, this should be pointed out to the authors. Furthermore, restating the aims as the reviewer understands them as written could be helpful to the authors during the revision process as it may give insight to where the communication failure lies.

The methods section should begin with a clear and accurate statement on study design and a statement regarding ethical approvals. For example, the reviewer should have the answers to the following questions; was the data gathered in a prospective or a retrospective design, is the study an experimental design or observational, was the data collected in a longitudinal or cross-sectional fashion? The population/subjects of study should also be explained clearly with specific inclusion and exclusion criteria. The conditions under which data was gathered should also be obviously stated (Was data collected during clinic visits or over the phone? Who collected the data?). Specific information on the variables collected must be present. Of particular importance is explaining the dependent, or outcome, variables and describing in detail the methodology of acquisition or measurement. Variables that are more commonplace may require less explanation or assurances of validity (i.e. the Cobb angle in scoliosis measurement is a well-established measure). Still, if the variable is unique the authors should provide enough information so that readers could replicate such a measurement, which can be done in written or pictorial format. This would also be critical for any unique, independent variables assessed as well. Reliability of measurement is also a critical component of study design. Thus, a note on how the researchers addressed this is also helpful for the readers to understand the generalizability of the findings.

Table 2. Essential Components of a Scientific Manuscript

Introduction

- Scope of the problem being studied
- Description of previous research
- Evidence for gaps in knowledge and how this study addresses them
- Clearly stated aim(s)/hypothesis(es)

Methods

- Description of study design
- Statement of ethical review
- Define variables included and methodology for collection
- Statistical analysis

Results

- Describe the cohort characteristics
- Results presented in order of stated aims
- Tables and figures supplement the text (not repeated information)

Discussion

- Summary of the findings for each stated aim
- Compare current findings with previous research
- Context of findings (generalizability)
- Strengths, limitations, future directions
- Conclusion

The last part of the methods, when applicable, should be a detailed description of the statistical methodology and information on *a priori* power analysis if applicable. If inappropriate statistical methods are utilized, the conclusions drawn from the results of a study could be invalid. While it is beyond the scope of this article to provide the knowledge necessary to be able to conduct an adequate review of the statistical methodology, there are many resources available. [6-11] It is highly recommended that clinicians performing reviews of scientific articles invest some time in becoming familiar with the basics of statistical analysis. There are various articles on PubMed, written for the busy clinician that can help facilitate this learning process and enhance the ability to critically review the statistics utilized in a scientific manuscript.[6-11] One should not assume that the statistical methodology is appropriate because it is not understood or appears to be in order with advanced statistical terminology. If in doubt, a reviewer should consult with a colleague that has expanded knowledge in the area of statistics or suggest the editor involve a statistical reviewer.

The first part of the results section should provide a detailed snapshot of the characteristics of the subjects/samples being studied. Pertinent demographic information (age, gender, ethnicity, and race) and baseline characteristics relevant to the subject of study are critical to allow for reproducibility as well as generalizability of the findings. Following the cohort characteristics, the results of the statistical analyses should be presented in a logical order, following the same order as the statement of study aims. The results section should be objective statements of numbers and facts and be free of any subjectivity or interpretation. Tables and figures are often very useful to convey findings in a way that is easiest to comprehend; however, they should be used to supplement the results in the text, not replicate them. A reviewer should pay careful attention to data that is duplicitous and decide which format (text vs. table/figure) lends itself to easy interpretation. One should take notice of whether descriptive statistics are used appropriately; means ± standard deviation presented only for continuous data, median/ranges used for ordinal data, and percentages used for nominal/categorical data. Ranges (minimum and maximum values) are an often forgotten descriptive statistic, but can be very informative to give a more detailed picture of the sample being studied (for example, are only cases with minimum deformity or disease represented in the study or does the range accurately reflect the scope of the problem being studied).

The reviewer should also take notice of whether statistically significant findings are clinically relevant. The authors may report a highly significant p value of <0.001; however, the mean difference in a measurement between groups could be within a 'known' measurement error or be below an already established minimum clinically important difference (MCID). Confidence intervals are typically underreported but can also aid in interpreting the relevance of the results. Conversely, statistically insignificant findings could be the result of inadequate power, which is a complex issue if no *a priori* power analyses were performed. By definition, an insignificant finding will be underpowered, and asking the authors to report the power in a post hoc fashion is essentially asking them to report the p value in a different manner.[12] Instead, a reviewer could ask the authors to provide the likelihood of observing a significant finding, presuming a small effect size or the smallest effect size of interest, with the sample studied.

In the discussion, the reviewer should take note of the presence of the components listed in Table 2. While the discussion is typically the longest section of the article, comparisons to previous research should be relevant and logical without extraneous or irrelevant information. The subjective interpretation of the results should be well delineated, and there should not be a restatement of the objective components of the results section (no p values should be found in the discussion). Perhaps the two most important things to take note of are, have the authors provided a clear take-home message, and are the conclusions directly supported by the data presented?[13]

It is important to recognize that some readers may skim through most of the article and head straight to reading the conclusion. A critical job of the reviewer is to ensure that the message and the conclusion, which so many readers focus on, is vetted and in fact based on the data.

While the abstract is at the beginning of the article, it is more helpful to provide a critical review of this section after conducting the complete review of the detailed sections above. Once the reviewer has become familiar with the study, they should circle back to the beginning for review of any minor issues noticed in the abstract. The hypothesis, methods, results, and conclusion should mirror that of the body of the text. The results presented should be those upon which the conclusion was drawn.

Part 3: Conclusion

This article provides a detailed guide for clinicians and scientists when reviewing both abstract and manuscript submissions. Setting aside ample time and following a structured review process will allow the reviewer to provide substantive feedback to the authors and editors while also improving the overall quality of work in the medical literature.

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