

INVITED REVIEW

Scientific Publishing: The ‘Write’ Tips

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ABSTRACT

Publishing in a peer-reviewed journal is the ultimate platform to share new knowledge with other researchers, health professionals and the public. Few of the submitted articles may not even reach peer-review stage. It can get rejected either at the technical modification/initial screening stage or after the review is completed. To avoid rejections at the initial stage, the manuscript should be well-drafted according to author instructions of the selected journal. This article aims in providing the young researchers with tips to write an article for biomedical journal.

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INTRODUCTION

Scientific medical writing and publishing is an excellent way to disseminate scientific ideas as and new research findings to the other healthcare professionals and scientists. Researchers want their ideas published for various reasons which include knowledge sharing, career advancement, prestige and monetary gain.¹ There are various categories of medical writing, like original research, case reports/series, short communication, systematic reviews and letter to the editor. Regardless of the category of articles, there are vital steps involved in writing a good scientific manuscript. Coupled with good scientific content, adequate writing skills improve the chances of an article for acceptance. Though standardized format exists to write and provide the acquired data in a more organized way there is no foolproof way to write that will ensure publication. This article highlights on tips to fine tune the writing style with regards to original research in biomedical journals.

The International Committee of Medical Journal Editors has issued guidelines for the conduct, reporting,

editing, and publication of scholarly work in medical journals. Periodical revision of these guidelines is undertaken and was last revised on December 2014.² Each journal has customized author instructions to suit the processing of the article. Rule of thumb for writing a good manuscript is to follow the author instructions given by the respective journal to which the article is to be submitted.

Manuscript writing can be divided into various stages: the planning, writing and publishing stage.¹ In the planning stage, the researcher has to decide on a suitable journal, the intended target audience and define a time frame to finish the manuscript writing. In the writing stage, the author has to develop an outline of article, prepare the first draft, decide on the title, develop marginalia, edit and revise the manuscript. In the publishing stage, the author, after final editing, has to submit the manuscript to the selected journal. If the article gets rejected the authors can decide on the next journal and redraft it according to the journal’s instruction.

Sullivan has identified the five ‘rights’ to write that can make the manuscript more appropriate for publication.³ The right topic with the right information submitted to the right journal written with right words, at the right time makes the manuscript more feasible for publication. Table 1 depicts the stages of manuscript writing and the uses of five rights suggested by Sullivan.

Table 1: Stages and the five ‘rights’ of publishing

Stage	Right	Details
Planning stage	Right journal	<ul style="list-style-type: none"> Target audience Scope of journal Impact factor of journal Article processing time
	Right topic	<ul style="list-style-type: none"> Novelty of the rationale Rationale should suit the scope of the journal
	Right time	<ul style="list-style-type: none"> Does the information add to the current existing literature? Are the materials used in the study are clinically used? Is the methodology used still valid?
Writing stage	Right information	<ul style="list-style-type: none"> Never falsify data Provide accurate information
	Right words	<ul style="list-style-type: none"> Follow author instructions Concise and clarity in writing Grammar correction Plagiarism check
Publishing stage		

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PLANNING STAGE IN MANUSCRIPT WRITING

Ideally, the process of scientific writing starts as early as research planning stage and continues through the research process. The rationale of the research should have novelty and should address the current clinical scenarios. For example, a research topic on direct filling gold may be redundant in comparison to a research on nanomaterials or biomaterials. Similarly, the methodology used for the research should be a currently valid method. For example, performing a dye leakage study to assess the sealing ability of dental materials may not be an effective method.

Choose the Suitable Journal

Prior to start of writing the manuscript, the authors should decide on a suitable journal. The authors can consider the following factors to decide on the journal. Every journal has its own mission statement based on their readership. For example, a case on canal variation of tooth may not come under the scope for an orthodontic journal. The author should know the target audience (whether they are general dentists, specialists, researchers or administrators). The authors should also look into other features of the journal like the impact factor of the journal, indexing of the journal and the article processing time prior to writing the manuscript. Once a suitable journal is selected, the manuscript has to be prepared according to the author guidelines for the respective journal. These guidelines usually aids the author in drafting the manuscript and includes the word limit, writing style, referencing style, number of figures and manuscript submission process. The other important aspect in planning stage is to develop a time frame for finishing the manuscript.

WRITING STAGE

The writing stage includes writing the first draft, selecting an appropriate title and final revising and editing.¹

TITLE AND TITLE PAGE

The title of the manuscript creates major impression as it is encountered first by the editors, reviewers and readers. The title gets recorded in electronic databases and makes the article discoverable easily. It can motivate or discourage the interest of a reader which ultimately determines the impact of the article.⁴ The title needs to be simple, direct, informative and concise. It should be accurate with appropriate keywords and also interesting. It has been observed in Google Scholar that, having keywords in the title gives a high impact for the article ranking.⁵ The title can be made concise by avoiding words like 'An observation of...', 'A rare case report...'.
 Authors can avoid using abbreviations in the title. Most of the journals ask for a short running title that will be printed in the top or bottom of every page of the article. The keywords of the title can be given as running title with the use of 30 to 50 characters.⁶ The authors should provide all the details mentioned in the author guidelines in the title page which mostly comprises the name and affiliation of the authors, details of the corresponding author and running title.

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AUTHORSHIP CRITERIA

Being an author provides credit, but the authors are accountable for the manuscript. Gifting an authorship in articles can occur due to various reasons. Many a times the author is neither the originator nor the writer of the paper, but may be a part of the team in giving technical input and interpretation of the ideas. 'The International Committee of Medical Journal Editors (ICMJE) recommends that authorship be based on the following four criteria:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work.
2. Drafting the work or revising it critically for important intellectual content.
3. Final approval of the version to be published, and
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. Those who do not meet all four criteria should be acknowledged'.²

ABSTRACT AND KEYWORDS

After title, the most read part of the manuscript is the abstract. This part of manuscript gets included in electronic databases which can persuade or discourage the reader. A properly drafted abstract should be a brief summary of the study. For an original research article, it is usually structured into aim, methods, results and conclusion. Every journal specifies the word limit and the format in which the abstract has to be written for various categories of the paper. The abstract should be written in past perfect tense, active voice and no citations. The abstract should be self-explanatory with results and conclusion. Most of the journals ask for 3 to 10 keywords. Authors should use MeSH keywords which makes the manuscript easy to locate in electronic databases.⁷ For example, use keywords like 'root canal irrigants' or 'endodontic irrigants' instead of just 'irrigants'.

MAIN MANUSCRIPT

The body of the manuscript for an original article is usually is divided into introduction, materials, results and discussion (IMRAD) format.

Introduction

Introduction should be short, succinct and interesting which will make the readers intrigued about the study.⁷ The introduction usually has two parts: background information and purpose of the study. Before starting to write the introduction, the author should plan a flow chart for the introduction and should address the following:

1. Broad-based facts regarding the topic
2. Specific previous literature with regards to the topic
3. Why was this study undertaken and what is different from the previous studies?
4. Is this adding to the current literature knowledge?
5. Novelty of the rationale has to be mentioned
6. Conclude the introduction with the aim of the study

Points 1 and 2 give the background information of the study. Points 3 to 6 address the purpose of the study. The introduction must not include a review of literature and excessive citations can be avoided. More than three references are not required to justify a well-known fact.⁸

Mistakes to Avoid

- Too long or short introduction
- Over doing on the references and avoid literature review
- Missing out important work in the related topic
- Mentioning the conclusion in the introduction

Materials and Methods

Writing the methods section is the easiest part of the manuscript though being the critical part of the study. Doing a thorough literature review and drafting a good research protocol prior to the research, makes the writing of methodology section very easy. Methodology section should logically and systematically describe in chronology how the study was carried out. By addressing 'what, how, when, where, how often and how much' was tested, the methodology section becomes complete. The important aspect of methodology section is that it should have brevity, clarity and replicability.⁹ For original research articles, it is usually written in three parts namely sample preparation, sample assessment and statistics. Complete product details has to be mentioned within parenthesis next to the material for the first time it is mentioned in the methodology. If an innovative methodology is used for assessment, it has to be elaborately explained. References must be provided for commonly used methodology

and assessment criteria: For example, reference must be provided for smear layer assessment with scoring criteria proposed by Sadr-Lahijani.

The section on statistics has to be given in the end of methods section for a quantitative study. The exact tests used for analysis (for each parameter separately) along with the software used should be mentioned. Statistical terms, symbols and abbreviations have to be identified. The cut-off of p-value which was considered significant has to be mentioned.

Mistakes to Avoid

- Enumerating the materials separately
- Avoid images of samples and common equipment and materials used
- Never include results

Results

The results section addresses the question 'what was found from the study'. The result section has to be brief and organized. Drafting the result section should be chronological and logical. It has two parts: the textual content and table and illustrations.⁶

Textual Content

The results section should be structured in the similar way to that of methods section. It should be written in past tense. Results should address one parameter per paragraph from the most significant to least one. Results and data have to be clearly delineated. Data are factual numbers whereas results are interpretation of data. For example 'the mean growth factor release from pulp when restored with mineral trioxide aggregate (MTA), biodentine and calcium hydroxide was 66, 33 and 10 ng respectively'. This sentence gives the data obtained. It can be better represented as follows: MTA shows two times more growth factor release than biodentin and 6.6 times more release than calcium hydroxide when restored over pulp (66 vs 33 ng, $p < 0.05$; 66 vs 10 ng, $p < 0.05$).

Tables and Illustrations

Tables and illustrations have a visual impact. It should be self-explanatory because few readers may skip the textual content. When exact values of extensive data is available, which cannot be explained in sentences, a table is preferred. Tables have four parts: table titles, column heading, body of text and footnotes. The symbols used in the tables have to be identified in footnotes. The table should include enough data to make it efficient but also be concise and easily readable. Every journal specifies the maximum limit of tables and figures allowed.



The tables and illustrations have to be numbered and inserted in the text of the manuscript in the appropriate place. If figures of patients are used it should be made unidentifiable. If a figure from previous article is used, it has to be appropriately acknowledged and a written permission from the copyright holder has to be provided during submission.

Mistakes to Avoid

- Do not repeat the same findings in both text and in tables
- Tables should not cluttered
- Use of too many tables and illustration has to be avoided
- Rule of thumb is to avoid illustrations when its usefulness is doubtful
- Never falsify data
- Avoid giving raw data of all samples

Discussion

In the previous sections we have discussed why we did it, what we did and what we found. So in discussion the question to be answered is 'why we got this and so what?' The discussion of the manuscript should be like a story which discusses one issue in each paragraph and logically leads to the next till the conclusion. In this section, the results are interpreted in a concise and succinct manner. The word limit should be limited to 1000 words. The first few sentences can be a brief mention of the observation of the study. Then, if required the methodology and rationale can be defended. Subsequently, the key findings can be discussed in few paragraphs starting with the main observations. Studies which concur and differ from the findings can be discussed here. Clinical impact of the study should be discussed. Every study will have pitfalls in the methodology or other aspects and cannot be flawless. Limitation and future scope of the study should also be mentioned. The discussion should end with a realistic conclusion. Never conclude something that is not done in the study. Conclusion should be only two to three sentences and understated.¹⁰

Mistakes to Avoid

- Avoid repeating the points written in introduction
- Avoid repeating the results again
- Never write too long or too short discussions
- Describing every similar study in the literature is not required.

References

References form the basis of the research undertaken which justifies the rationale and methods followed in the

study. They also provide the context for the interpretation of the result obtained. Thorough literature search gives the appropriate references for the research. This should be done prior to the study and not after completion. During manuscript writing, the references have to be inserted in the appropriate places at the end of sentences. Two most common formats for referencing is Vancouver and Harvard formats, which might be modified by the journal according to their needs. Every journal has its own format and limit on the number of references depending on the category of the article which will be mentioned in the author guidelines. Traditionally, to manage references, authors have used index cards. But with the advent of electronic databases and improvement in technology, it has been simplified by reference management software. Few examples are endnote, reference manager. The advantages of these softwares are that they allow the references to be imported directly into the reference manager rather than be hand typed. Mostly, it can import from EMBASE, PubMed and other electronic database.¹¹

Mistakes to Avoid

- Avoid over and archaic citations
- Avoid excessive self-citations
- Always cite primary references and avoid secondary citations
- Make sure the reference cited in text and in the reference section coincides.

WRITING STYLE

The secret for successful publication is good research topic coupled with good writing style. Researchers should follow the 'KISS' format (keep it simple and short). Few basic tips can be followed for good writing style (Table 2).¹²

Revising the Manuscript and Submission

After the first draft, the manuscript has to be revised and edited. Grammatical errors in English can be corrected with online software. We have various paid and free software like grammarly.com. Few of the journals also provide the author with options of online grammar checking software before manuscript submission. The authors have to create separate title page, cover letter, abstract page, the main manuscript (without author or institution details). Most journals insist that the figures and tables should be uploaded separately. Nowadays, electronic submission of manuscript is made easy with less number of steps. Mostly, the journal will guide the authors step by step for electronic submission. The authors should upload all the documents in sequence and verify the final document before submission.

Table 2: Tips for good writing style

<i>Writing paragraphs</i>
<ul style="list-style-type: none"> • Should be well structured • No hard and fast rule for length of paragraphs avoid more than 25 sentences or less than five sentences • Paragraph should have a lead sentence and then the body of the paragraph should have logical texts defending the lead sentence
<i>Writing sentences</i>
<ul style="list-style-type: none"> • More than two type written lines may be considered long • Active voice is preferred. For example, 'calcium hydroxide was introduced in endodontics by Hermann' can be written as 'Hermann introduced calcium hydroxide as intracanal medicament' • Avoid verbosity • Never end a sentence with a preposition • Introduction and discussion can be written in present tense Methodology and results should be written in simple past tense
<i>Writing words</i>
<ul style="list-style-type: none"> • Avoid jargons • Abstract nouns can be replaced with verbs. For example, 'the interpretation of data was done using Statistical Package for the Social Science (SPSS) 15'. It can be rewritten as 'the data were interpreted using SPSS 15' • Use minimal abbreviations. Avoid abbreviation in title • Avoid referring to people as case or subjects • Follow either American or British English throughout the manuscript and follow author guidelines

Table 3: Reasons for rejections of manuscript

<i>Reasons for rejections</i>
1. No novelty in rationale
2. Methodological flaws/inappropriate study design
3. Author does not respond on time and to all points of the reviewer
4. Plagiarism
5. Ethical issues
6. Topic out of scope of journal
7. Data inconsistency/fabrication
8. Poor writing style
9. Author instructions not followed
10. Extensively written article particularly when discussion is not strong enough to defend the results

REJECTIONS

Once submitted the manuscript will be sent for peer-review. The reviewers comment will be forwarded to the author. The author has to upload the revision addressing the reviewer points. Then the author has to wait on

the decision of acceptance or rejection of manuscript. There are many reasons for a manuscript to get rejected (Table 3).^{13,14} Once the article is rejected, the author needs to correct the article and reformat it to the next preferred journal. Perseverance, being systematic and sincerity, plays a major role in successful publication.

CONCLUSION

Publishing a research work is of vital importance to any researcher. Peer-reviewed journals are the best platform for the research to reach globally. To publish successfully, the authors should plan the study, select the journal and the appropriate target audience, follow the author guidelines, be systematic and show perseverance.

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