

Writing research papers for publication

8.1 Why publish your research results?

No job is finished until the paperwork is done. Thus, scientific work is doing its job only when it is published. A published research work will serve several objectives:

- As evidence that a research work has actually been conducted and accomplished.
- Providing confidence that the work is able to pass the scrutinised process by peer-reviewers.
- As information and resource to other researchers in the field.
- As way of obtaining external awards, as being cited by other researchers, getting attention of sponsors for further studies or post-doctoral positions, etc.
- As credit points to support your career. Although important, this should not be the main objective of publishing a paper, as you may tend to contribute information, which is not quite meaningful.
- As way of obtaining research grants. A good publication track record is a must-have requirement when applying research grants.
- As way of obtaining additional income. If your research is purchased after being published, this may serve not just recognition but also financial benefit.
- Of foremost importance, your motivation for publication shall be to make a meaningful contribution to the understanding and development of research in your field.

8.2. Initial preparation

Some tools can be recommended for writing a manuscript. For example, collaborative editing of documents online is possible with tools such as Google Docs, Google Drive

or Dropbox. The use of track changes helps this editing process. It is also suggested to use electronic reference software. Nowadays, open source software can be easily downloaded and used (for further explanation, go to Section 8.8).

Besides preparing tools for the authors in writing the manuscript, it is also necessary to decide a suitable journal as a target for the submission. Although the best journal with the highest impact factor or the greatest prestige is a common desire of most authors, other journals with good readership and reputation can possibly be a more realistic target. Basically a target journal should be selected, so that the proper writing style for the manuscript can be started. Information related to "Instructions for Authors" or "Author's Guideline" should be obtained, understood and complied with (for further explanation, go to Section 8.6). Mistakes will prolong the reviewing process. The common mistakes are failure to fulfill at least one requirement as described in the Instruction for Authors or the detailed checklist of manuscript preparation, which occurs to about one third of submitted papers.

8.3. Choosing the most suitable journal

The easiest way to publish your work is self-publishing your paper online. This is not just the easiest but also the cheapest way as it is absolutely zero cost. Several preprint servers are available for this like *arXiv* or *Nature Precedings*. However, recognition for your work by other scientists in the field will be minimal as the self-publishing submission does not have a filtering process by experts in the field.

Therefore, a peer-reviewed journal, is still considered the most legitimate way of publishing research works as it has the process of going through the eyes of the experts in the field. Most peer-reviewed journals are recognized publications, and the community members of a certain research field usually know many, if not all, the other major players in the field.

Considerations for choosing the most suitable publication for your research work include:

- Scope of the journal: It is important to choose a journal, which covers works of other scientists related to your area of research. You may not want your paper to be published in a journal of which the readers do not appreciate the contents of your research work. Moreover, your paper may also be subject to rejection by the editors.
- Language used: English would be the language of choice. Journals using local languages, which are not considered one of the major international languages, are less likely to be quoted by other scientists. The less quoted, the less your work is recognised.

- Credibility of the journal: is it frequently cited by other publications; does it have credible editors and reviewers?
- Length of process starting from submission of paper until actual publishing. This is perhaps the major drawback of submitting to a peer-reviewed journal: it may take more than a year until it is actually published.

8.4. Authorship

Authorship of a research publication may be a sensitive issue and so should be addressed clearly. The authors included and the order of appearance should be decided based on the contribution of each author. The International Committee of Medical Journal Editors recommends the following four criteria for eligibility as an author:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or revising it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- 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.

8.5. The process of submitting research work to a journal

After choosing the most suitable journal to your research subject, you should:

- Read the "Instructions for Authors" part of the journal, as you would not want to find yourself spending your time submitting your work only to be rejected because you did not pay enough attention to the requirements of the editors. Specific requirements like layout, font type, length of article, process of submission, *etc.*, are usually part of such instruction. Failure to comply with the journal's requirements is the most common reason a paper gets rejected by the editors.
- Prepare the draft manuscript (Section 8.6), share it with co-authors and edit to accommodate their feedback.
- Ask one or more colleagues and/or professors to review your research paper before submitting. They may find matters, which you missed like spelling errors, typographical errors, clarity of writing, conciseness, *etc.*
- Make a final check on content and presentation.
- Submit the paper. Be sure to use the right channel or address. While we are now in the digital era, some editors may still require printed copies.

8.6. Content and preparation of a manuscript

All journals have their specific instruction, which every author should follow. In general, however, all manuscripts contain the following sections:

1. Title and abstract

The title should be concise and descriptive. It has to be self-explanatory and create interest in the manuscript. Potential readers will find the article by scanning through lists of titles. Therefore, your title should be attractive enough to gain readers' attention. The title should include keywords listed in the manuscript. Generally, the title is best left for last when writing a paper. After the abstract and keywords are written, it is easier to develop a title.

The abstract reflects an overview of your manuscript, highlighting the major findings and conclusions. An abstract provides the first impression and influence to the editor to consider the submitted manuscript. It also provides the first impression and influence to the reviewer during the reviewing process. Therefore, the abstract should attract the readers to go further. Poorly written abstracts will likely diminish readers' interest in the work. Abstracts may be structured or unstructured, but should be written concisely without references and should never exceed the allowed number of words.

2. Introduction

The introduction should be brief and informative, describing the background of the subject matter reported in the paper; the rationale for the study; and the aim/hypothesis of study described. A crisp introduction is an essential ingredient of a good paper. Therefore, the introduction should tell what is known and what is unknown. The introduction should review and reference previously reported research but should not include data or conclusions from the research being reported.

3. Methods

The methods section should contain enough information to allow readers to understand the way in which the research was performed; to evaluate the findings, and to compare the study results with other published studies. The section should describe both experimental and statistical methods. The level of detail should be sufficient to enable others to reproduce the work described. Detailed descriptions of already published methods may be referenced. When preparing the manuscript it may be convenient to write the methods section after the results section to ensure that all relevant methods are included.

4. Results

The results section should be presented in the most concise format possible to provide

a clear description of the experimental findings without interpretation. Research data should be presented, processed and analysed, including statistical analysis where appropriate. Figures and tables are valuable tools to support data presentation and should be arranged in a logical sequence to support the descriptive text. The results section is the core of the research manuscript and many authors find it helpful to write this section before the supporting sections.

5. Discussion

The discussion section should start by stating the strength of the study and its major findings. The interpretations of results and the significance of the reported findings can be compared to other published data. Data should not be repeated in this section. Data should not be over-interpreted and the limitations of the study should be articulated. At the end of the paragraph, a conclusion should be provided to tell the significance of the study and its potential impact in the related field. In laboratory medicine there is usually a clinical context for the conclusion.

6. References

The references section is important because it defines the previously published research that you have used to design your research project, interpret the results, draw conclusions and put into clinical context. All journals define the way in which references should be presented, usually in accordance with international convention. Only key references should be listed.

8.7 Electronic reference management

Technology has made it possible for researchers to save, retrieve and quote references related to their publications in a simple manner. Several 'reference managers' or 'citation managers' are available free on the internet. The choice for each researcher may depend on individual preferences. Most also provide features for researchers' social media, which allows sharing of references between researchers or even formation of a collaboration between a peer group of researchers or a public group. Tutorials are also available on the internet to familiarise oneself with the major reference managers

In general, the reference managers enable the researcher to:

- Keep and store across devices, search and sort references, documents and notes in one place, down to the keyword.
- Tailor citation and bibliographies according to individual needs.
- Share and collaborate. This can be performed for either public or private sharing of reading lists, references or even full-text articles. Collaboration in writing a manuscript is often possible using these applications.

- Showcase a work.
- Keep statistics of your work: who, when, from where, how frequent are your papers cited or downloaded.
- Trace researchers and activities of other researchers on the same subject.

Below are some applications available on the internet, which can be downloaded free:

- Mendeley (www.mendeley.com)
- Zotero (www.zotero.org)
- EndNote basic (<http://endnote.com/product-details/basic>)
- Docear (www.docear.org)
- ProQuest Flow (<https://flow.proquest.com/>)

8.8. Ethical considerations

Ethical violation in medical research is not uncommon, including in research publication. Researchers need to pay attention in order not to expose themselves to accusations of unethical conduct, which may damage an author's integrity. References to ethics in medical publishing can be found either in the form of books or articles.

Kerstin Stenius classifies ethical issues into seven categories:

Carelessness: citation bias, understatement, negligence.

Redundant publication: same tables or literature review reports without noting prior source.

Unfair authorship: failure to include eligible authors.

Undeclared conflict of interest: failure to cite funding source.

Human/animal subjects violations: no approval from Review Board or Ethics Committee

Plagiarism: reproducing others' work or ideas without citing the original source.

Other frauds: fabrication or falsification of data, misappropriation of others ideas or plans given in confidence.

8.9. The review process

Manuscripts are seldom accepted after initial submission. Most of the time, the author will be asked to make revisions based on the comments of referees. The editor may ask you to revise your paper, but as long as there is no statement of clear rejection, then it is always a positive review. Respond precisely and constructively to the requirements of the editor, although you are the one who knows most about your research work. Even if the journal finally still rejects your paper, you can still submit your work to other publications.

8.10 References:

Bavdekar SB. Authorship issues. Lung India 2012; 29:76-80

Binder R, Friedli A, Fuentes-Afflick E. The new academic environment and faculty misconduct. 2015; Acad. Med. [Epub ahead of print] doi:10.1097/ACM.0000000000000956

Boyd JC, Rifai N, Annesley TM. Preparation of manuscripts for publication: Improving your chances for success. Clin Chem 2009; 55: 1259-1264

Cook DA. Twelve tips for getting your manuscript published. Med Teach 2015; 38: 41-50

Derntl M. Basics of research paper writing and publishing. Int. J. Technology Enhanced Learning. 2014; 6: 105-123

Jha KN. How to write articles that get published. J Clin Diagn Res 2014; 8: XG01-XG03

Members of the ICMJE. 2013. Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals. <http://www.icmje.org/icmje-recommendations.pdf>

Stenius K. Workshop on scientific integrity and ethical issues in publishing. AIDS 2010: Slide of the XVIII International AIDS Conference 2010 July 18-23, Vienna, Austria. https://www.iasociety.org/Web/WebContent/File/AIDS2010_Scientific_Integrity_Workshop_presentation.pdf