

How to Write Articles That Get Published

KIRTI NATH JHA

ABSTRACT

Publications are essential for sharing knowledge, and career advancement. Writing a research paper is a challenge. Most graduate programmes in medicine do not offer hands-on training in writing and publishing in scientific journals. Beginners find the art and science of scientific writing a daunting task. 'How to write a scientific paper?', 'Is there a sure way to successful publication?' are the frequently asked questions. This paper aims to answer these questions and guide a beginner through the process of planning, writing, and correction of manuscripts that attract the readers and satisfies the peer reviewers. A well-structured paper in lucid and correct language that is easy to read and edit, and strictly follows the instruction to the authors from the editors finds favour from the readers and avoids outright rejection. Making right choice of journal is a decision critical to acceptance. Perseverance through the peer review process is the road to successful publication.

Keywords: Medical writing, Publication in biomedical journal, Preparation of manuscript

INTRODUCTION

Writing and publishing scientific papers is the core business of every researcher [1]. The scientific output medical researchers generate is not only important for society to improve health through advancement of knowledge but also for the individual researcher's career [2]. Effective scientific writing, however, is not easy [1].

Scientific paper has a required structure and style. However, a research article is not only a technically rigid document, but also a subjective intellectual product. Therefore, it requires good skills in both structuring and phrasing. These skills are acquired through experience, and can also be taught [3]. 'Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication' gives the required technical and structural details of scientific papers [4]. Also, there is no dearth of literature on scientific writing and publishing. Ironically, most graduate programmes in medicine do not offer hands-on training in writing and publishing in scientific journals. Therefore, most authors learn the art and science of scientific writing the hard way; though there are papers that provide step-by-step guide to writing [5].

What constitute a good paper- worthy of publication? There are no straight answers. Some define a good paper as a clear, coherent, focussed, well-argued document that uses unambiguous language [3]. Editors and reviewers appreciate manuscripts that are easy to read and edit [4]. However, no foolproof rules exist for success in publishing a manuscript. Good scientific content of a paper alone does not guarantee its publication in a good journal [5].

This article presents a review of the selected articles on writing and publishing in biomedical journals and aims to provide beginners the basics of effective scientific writing, and tips on successful publishing.

Writing a Scientific Paper: Getting started.

When planning a scientific paper, Berk's memo to the authors in the American Journal of Roentgenology is worth following [6]. He felt that getting the things right the first time improved the chances of acceptance and avoided revisions. He set out 5 guiding principles for the inexperienced authors : They are : 1. Determine the specific focus of your article, 2. Select the right journal, 3. Decide the type of article, 4. Follow the guidelines for authors published in the selected journal, 5. Revise, revise, and revise. Remember, "the most of the important work of composing a manuscript occurs during the study design that is critical for determining the resultant manuscript's publication [7]. Therefore, study design and methodology requires

careful planning; they form the touchstone on which results and conclusions are tested.

PREPARING A MANUSCRIPT

The scope of work determines the type of article. The choice of journal depends upon the field a journal covers, area of research, time frame for publication, and the journal's impact factor- a proxy for relative importance of the journal within its field. 'Uniform requirements for manuscripts submitted to biomedical journals: writing and editing for biomedical publication' provides the guidelines for preparing manuscripts for any journal [4]. The text of observational and experimental articles is usually divided into sections with the headings, introduction, methods, results, and discussion, the so-called "IMRAD" structure. Other types of articles have different structure. Therefore, it is necessary to familiarize with and strictly follow the instructions to the authors of the target journal.

To begin with read a paper written in the format you plan to write. Prepare a skeleton of your paper [8]. Note down the key points in each section. It is neither desirable nor practical to actually write the article sections in sequential order. Introduction and the discussion may wait till at the end. Abstract may be written the last.

Keep the language simple, concise and easy to understand. Follow UK or US English as desired by the journal. Remove all unnecessary words. Use active voice rather than passive. The sentences should begin with the operative word and end with the message. Expand the abbreviations when used for the first time. Check the grammar and spelling. A word processing tool may be helpful. However, many biomedical words do not exist in the vocabulary of the word processing tools. Here, the textbooks or a medical dictionary may be helpful.

Following text sequentially discusses the elements of the individual sections of a scientific paper. Peer-review and reasons for rejection are discussed subsequently.

Title: A good title should attract and inform the readers and be accurate [9]. It should make it stand out from other literature in the field [10]. Titles may be phrased in a variety ways. Some examples of descriptive and informative titles are given below:

- Correlation of Tear Fluorescein Clearance and Schirmer test scores with Ocular irritation symptoms (a descriptive title)
- What Are the Biomarkers for Glaucoma?
- Dry eyes: are new ideas drying up?

- Angiotensin-2 levels are elevated in exudative pleural effusions (informative title)

As a rule, the title should contain all the words that the readers use for searching relevant literature. The authors may, to begin with, consider a number of titles and finally choose the most appropriate. Co-authors and peers may provide useful suggestions. Some journals also ask for short running titles in limited characters to be used at the top or bottom of the journal page. Provide a short running title whenever asked.

Abstract: The abstract reflects the main story of the scientific paper. While reading articles most readers go no beyond the abstracts. Therefore, the abstract should attract the readers to go further. Abstract may be structured or unstructured. Most journals ask for a structured abstracts within given word limit. Structured abstract is divided into:

1. **Background:** What is known and why is this study needed?
2. **Methods:** What did you do ?
3. **Results:** What did you find ?
4. **Conclusion:** What does it mean ?

Write the abstract in past perfect tense, active voice, and with no citations.

Provide word count, if asked, and key words for indexing, preferably confirming to medical subject heading (MeSH) vocabulary. MeSH vocabulary is available on www.PubMed.com .

Introduction: A crisp introduction is an essential ingredient of a good paper. A good introduction will “sell” the study to editors, reviewers, readers, and sometimes even the media [11]. It should tell what is known, what is unknown, and also the rationale behind the study. The introduction should start with the background of previous research, and state the aim, the research question, and the study design. Give in the introduction only the strictly pertinent references and do not include the data or conclusions from the work being reported.

Methods: The methods tell how the study was conducted and how the conclusions were arrived at. Methods of an original study have four basic elements; study design, setting and subjects, data collection, statistical methods, and ethical approval. Describe the type of study (prospective/ retrospective/ experimental/ observational), the subjects or the study population (human/ animal), the sample size and sample size calculation, recruitment of study population, methods of randomization, blinding, inclusion and exclusion criteria, measurement tools, outcome measures, and statistical analysis. The methods provides the readers insight into correctness or otherwise of design. Also, details of methods allow the readers to replicate the intervention or experiment so that they can try and test for themselves the efficacy of an intervention and the validity of conclusions. While describing new surgery or experiment provide sufficient details. When you followed a standard procedures described elsewhere, provide the relevant references.

Results: Results answers the research question without interpretation. Structure the results like the material and methods [12]. Be objective and use past tense. Remove all the superfluous details that does not form the part of study question, outcome measure or a factor affecting it. Start the results with recruitment process, and a description of demographic characteristic of the population. For controlled trials first describe the experimental group followed by the control group. Give both the percentage and the actual numerical values with decimals e.g. 90%(54/60). Wherever applicable present the values with mean, standard deviation (SD) and 95 % confidence interval. Describe the primary and secondary outcome, and also the unexpected findings. Give p-values with 95 % confidence interval to state the beneficial / adverse effects established by a test of statistical significance. Also provide effect sizes e.g. odds ratio or relative risk with 95 % confidence interval.

Do not over interpret the results. Over interpretation of result may weaken the impact of conclusion and result in rejection of your paper.

Tables, charts, graphs and figures reduce the text and makes visual impact for easy reading. Number the figures, tables, charts, graphs and the photographs serially. Mention them in the text at appropriate places. Prepare the clinical photographs and diagrams on separate pages in desired format (e.g. JPEG, TIFF, or PNG of desired file size and resolution). Provide as a separate file for the legends for figures, charts, and the clinical photographs. Place the legends after the references. Additional media, like video, in desired file format of given file size, may be submitted for online journals.

Discussion: Discussion interprets the results. Keep it concise. Begin the discussion with brief recapitulation of the main findings (the answer to the research question) without repeating the results. Repeating results in the discussion is a common mistake. Refrain from bringing in new findings. Compare your results with the findings of similar studies by other authors and explain the reasons of variation. Emphasise the new findings. Interpret the unexpected. Underline the implications of your findings. Also, describe the strengths and weaknesses of your study. Finally provide a conclusion - the take home message.

References: References authenticate the scientific facts and statements. Include only the essential references. Cite most accessible reference, and the primary source rather than reviews. Eliminate archaic and irrelevant references, and references for established facts. Check the references for accuracy. Follow the referencing style suggested by the target journal. Most biomedical journals today follow Vancouver style or APA (American Psychological Association) style. There may be a limit for the number of references for a given type of article. Some journal offer online software for checking accuracy of the listed references. Limited number of references can be arranged manually. Especially designed referencing software is useful for maintaining and managing large volume of references. Annotation of references - sentence case or superscript- also varies. Follow the individual journal’s guidelines.

Submission: Revise your paper thoroughly before submission. Read it critically as you would another author’s paper. Ensure you have strictly followed the instruction to authors. Failure to adhere to the instructions may result in summary rejection of your paper. Check and recheck the language and grammar for errors. Create separate files for the cover letter, the abstract, the blinded article file (without author details); figures, charts, tables, and images, legends, and permission from copyright holder for use of published materials, etc. Provide in the cover letter the title, main findings, and their relevance. Ensure correctness of author details (name, surname, degree, etc.), authorship (first author, co-author, guarantor, corresponding author), and their mailing address and the institutional affiliation. Provide all the information desired by the editor including contribution of individual authors. Some journal require details of contributions of each author e.g., conception and design, data collection, statistical analysis, manuscript preparation and revision. Declare the conflict of interest, if any. Online submission shall remain incomplete unless you sequentially upload all the required sections, and the copyright transfer form signed by each author. The copyright transfer form should mention the corresponding author. Preserve the raw data and the final submission for future reference.

Reasons for Rejection: Rejection is an unpleasant situation, but common in scientific publishing. Initial rejection occurs at the editorial level. During the peer review, reviewers assess the quality of paper according to 2 main criteria: contribution to the field and the adequacy of research design [13]. Deficiency in the study design was the most commonly cited reason for outright manuscript rejection according to a study that queried the editors and reviewers [14]. A study that studied peer review evaluations of a large number of papers concluded that “the main determinant of the

recommendation for acceptance or rejection of a given manuscript was the relationship between the experimental design, the results, and the conclusion. Inappropriate experimental design was again strongly associated with rejection [15].

Failure to adhere to the 'instruction to the authors' is another important reason for rejection. Plagiarism in any form is another reason for summary rejection. Available software readily check the submission for plagiarism. Also articles found unsuitable for the journal on account of their content, language, grammar, and format are summarily rejected. There are excellent works that have identified the 'principles to improve the likelihood of publication of a scientific manuscript' and the reasons why manuscripts are not accepted for publication' [6,13,16]. Lack of what improves the likelihood of acceptance, is the cause of rejection. Common reasons for rejection other than those mentioned above include: poor study design, insufficient problem statement, incomplete, inaccurate, or outdated review of literature, suboptimal reporting of results, getting carried away in the discussion, and poor writing [17]. Language poses a problem for researchers from non-English-speaking countries. Some publishers provide paid language-services for manuscripts.

Peer review, Responding to Reviewers and Resubmission:

Peer review is considered the virtue of science communication [18]. Peer review is an essential tool the journals apply to maintain high quality and standard of the articles published in their journals. The process starts after your paper is past the editorial scrutiny. It supplements the authors work in making it more acceptable to the wider readership. Some journals ask suggestions for potential reviewers, and also those reviewers you will wish not to review your paper. Reviewers may accept, reject or suggest minor/ major revisions. Provide point-wise response to the reviewer's comments and in time resubmit the revised manuscript incorporating the suggestions for change. Highlight the changes in the revised manuscript. Remember, revision gives no guarantee for acceptance. But failure to respond and resubmit closes the door.

CONCLUSION

Writing and publishing is integral to research. Scientific manuscript has a required structure and style; the available literature provides adequate guidelines. Online abstracts and full text references, language services, and referencing software have made preparation of manuscript easier. Read the instructions carefully and adhere to them strictly. A beginner has to travel the learning curve of the writing, peer review, and publishing. Originality of content, valid study design, good manuscript- conforming to language, style, and format- are prerequisite for successful publication. Attention

to details at every stage and perseverance through the arduous process of research, manuscript preparation, peer review and publication is essential for success.

LITERATURE SEARCH

A PubMed search of the database (1990 to 2004) was conducted. Following key words were used: writing, publishing, biomedical journals, and peer review. Additional sources included publications cited in other articles. Relevant articles were reviewed and included.

REFERENCES

- [1] Kotz D, Cals JWL, Tugwell P, Knottneru JA. Introducing a new series on effective writing and publishing of scientific papers. *Journal of Clinical Epidemiology*. 2013;66:359-60.
- [2] Knottneru JA, Tugwell P. Communicating research to the peers. *J Clin Epidemiol*. 2007;60:645-47.
- [3] Hengl T, Gould M. Rules of thumb for writing research articles 2002. http://www.slideshare.net/alena_romanenko/hengl-gould-2002-rules-of-thumb-of-writing-a-research-article accessed 08March 2014.
- [4] Uniform Requirements for Manuscripts Submitted to Biomedical Journals: *Writing and Editing for Biomedical Publication*. www.ICMJE.org ; 1-36.
- [5] Kliever MA. Writing it up: a step-by-step guide to publication for beginning investigators. *AJR*. 2005;185:591-96.
- [6] Berk RN. Preparation of manuscripts for radiology journals: advice to first-time authors. *AJR*. 1992;158:203-08.
- [7] Provenzale JM. Ten principles to improve the likelihood of publication of a scientific manuscript. *AJR*. 2007;188:1179-82.
- [8] Kotz D, Cals JWL. Writing Tips Series (Effective writing and publishing scientific papers- part I:how to get started). *Journal of Clinical Epidemiology*. 2013;66:397.
- [9] Hartley J. Academic writing and Publishing- A practical guide.2008. New York: Routledge. Pp. 23.
- [10] Kotz D, Cals JWL. Writing Tips Series (Effective writing and publishing scientific papers- part II: title and abstract). *Journal of Clinical Epidemiology*. 2013;66:585.
- [11] Kotz D, Cals JWL. Writing Tips Series (Effective writing and publishing scientific papers- part III: how to get started). *Journal of Clinical Epidemiology*. 2013;66:702.
- [12] Kotz D, Cals JWL. Writing Tips Series (Effective writing and publishing scientific papers- part V:how to get started). *Journal of Clinical Epidemiology*. 2013;66:945.
- [13] Georges B. Reasons reviewers reject and accept manuscripts: The Strengths and Weaknesses in Medical Education Reports, Educating Physicians: Research Reports. *Academic Medicine*. 2001;76(9):889-96.
- [14] Byrne DW. Publishing your medical research paper. What they don't teach in medical school 1998. Baltimore: *Lippincott Williams & Wilkins*.
- [15] Turcotte C, Drolet P, Girard M. Study design, originality and overall consistency influence acceptance or rejection of manuscripts submitted to the Journal. *Can J Anaesth*. 2004;51(6):549-56.
- [16] Pierson DJ; The top 10 reasons why manuscripts are not accepted for publication. *Respiratory Care*. 2004;49:1246-52.
- [17] Celik Y. To Publish or Perish: Strengths, Weaknesses of a Medical Paper (I) International. *Archives of Medical Research*. 2011;1(1):47-53.
- [18] The pitfalls and rewards of peer review. *Lancet*. 2008;371:447.

PARTICULARS OF CONTRIBUTORS:

1. Professor, Department of Ophthalmology, Mahatma Gandhi Medical College & Research Institute, Pondy-Cuddalore Main Road, Pillaiyarkuppam, Pondicherry, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Kirti Nath Jha,
Mahatma Gandhi Medical College & Research Institute, Pondy-Cuddalore Main Road,
Pillaiyarkuppam, Pondicherry-607 402, India.
Phone : 9443655640, E-mail : kirtinath.jha@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Nov 14, 2013**
Date of Peer Review: **Feb 17, 2014**
Date of Acceptance: **Aug 19, 2014**
Date of Publishing: **Sep 20, 2014**