

Brief guide to writing a scientific paper

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Abstract

In this paper, we provide a rough template through which researchers in the healthcare industry could work towards the publication of their first manuscript.

In addition to discussing the components of a typical paper (original research), we briefly introduce the concept of a review article.

Keywords: Research; Writing a paper; How to write a paper; Guidelines on medical research writing

Introduction

Sharing your discoveries is one of the goals of a number of professionals. However, many professionals find little to no time to pursue this interest. Here, we provide a concise summary of the steps necessary to get published. It is not easy, writing a paper requires the scientist be extensively knowledgeable in their field (1). In addition to utilizing the authors' cumulative publishing experiences, online databases (Google Scholar) were utilized to review published literature available on the topic. Some were, unfortunately, inaccessible to the authors.

Prior to submitting your paper, we recommend assuring that your manuscript is in agreement with the uniform recommendations by the International Committee of Medical Journal Editors (ICMJE) (2); it is an excellent resource and we recommend utilizing it.

What is IMRaD?

Following writing your abstract, it is recommended you list the remainder of your article using the IMRaD principle (Introduction, Methods, Results, and Discussion) (3–8).

First appearing in Pasteur's Etudes sur la Bière in 1876 (9), IMRaD has gained popularity and has become the generally accepted method of writing research papers.

Despite the IMRaD being generally accepted as a great method for writing papers, data indicates that researchers, quite simply, do not read published researches in this manner (10). They seem to opt for skimming of published papers.

What are review articles?

Regardless of whether or not you wish to pursue an academic career, being updated on the latest research on your area of practice is of the utmost importance. We believe writing review articles to be a pre-requisite to

becoming a good scientist and researcher.

A review article is a research article that illustrates to the reader a fair, concise, and comprehensive review of the topic being researched; a well-written review article is, many times, cited long after publication (11,12). Despite this seeming rather easy when compared to original researches, review articles usually take some time (months) before a manuscript is ready for submission (11).

Not all topics are mature enough for a review article to be written on them; a good rule of thumb is to see if you could easily locate 20 papers published on the topic in the past 5 years or so (11).

A typical review article has 150-250 references.

Writing an introduction:

For most publications, between 1 and 3 paragraphs are a sufficient introduction. Here, you are supposed to introduce your hypothesis, rationale, justification, and objectives in addition to introducing similar research to yours (literature review) (3,13–15). Unnecessary expounding serves minimal purpose and could be, in many instances, counterproductive.

Writing your Methods:

In addition to illustrating the technical aspects of conducting your research (remember this should be written in a manner which allows for your experiment to be repeated), the responsibility lies now on the first author to draft the first manuscript and determine their co-authors (3,16).

Writing your Results:

This is the most important section of any paper, as it is where you will illustrate what your experiment resulted in. This should be written clearly and concisely.

Your goal is for your results to be skimmable, avoiding unnecessary repetition. Furthermore, avoid, as per Alexandrov, 'opening sentences like: 'Table 1 summarizes our findings in subgroup C'. This makes reviewers frustrated since they have to flip back and forth through pages to understand what was done to study subjects' (3).

Writing your Discussion:

In this section, you should start by briefly summarizing your findings (be careful not to repeat your introduction or results section). The novelty of your findings should also be discussed briefly here. Following this, you are to compare your findings to the published literature. Mention both agreements and disagreements with your findings (17,18).

Any limitations you faced should also be mentioned here, remember that it is better that you discuss the weaknesses and unresolved areas of your study than for someone else to.

Writing your Conclusion:

In your conclusion, you are to summarize what significance your data carries and what it entails.

Final step:

Your project is said to be complete when it is published in a peer-reviewed journal (19,20).

Most submitted manuscripts are, unfortunately, rejected. With scientific writing being an ongoing, ever-improving field, such instances should not discourage you; battling peer reviewers will only make you a better scientist. It is a skill worth developing.

Below is a list of the most common causes of rejection (in no particular order):

- i) Statistical inaccuracies (not complete, not appropriate, etc.)
- ii) Sampling issues (e.g. sample size not being representative of the population)
- iii) Issues with writing

- iv) Reporting inconsistencies
- v) Poor literature review (old, not enough, inappropriate, etc.).

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