

How to Write and Publish a Scientific Article?

Bilimsel Bir Makale Nasıl Yazılır ve Yayınlanır?

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Abstract

Today, writing and publishing scientific articles is amongst the most valid ways of scientific communication for scientists. They may also be written for academic advancement or to be appreciated by colleagues. The purposes of this review are to demonstrate the most frequent mistakes in scientific writing, to guide the authors in the preparation of appropriate articles, and to prevent waste of time in the process. Authors can make some errors during the preparation of the articles. Thus, a good article should be written with more attention to each section. Although several rules are published for article preparation, the author must have enough grammar knowledge to allow the reader to focus on what he/she wants to say. We consider that this review will help inexperienced authors prepare publishable scientific papers easily, and also will save the time during the publishing process.

Keywords: Scientific article, Publishing, Writing

Öz

Günümüzde bilim yapanlar arasında iletişimin en doğru yollarından biri bilimsel makale yazımıdır. Bilimsel makaleler akademik yönden yükselmek veya diğer bilim adamları tarafından tanınmak için de ele alınabilir. Bu çalışmanın amacı; yazar adaylarının bilimsel makale hazırlama aşamasında yaptıkları yanlışları göstermek, yazarlara uygun makale hazırlanmasında rota oluşturmak ve bu hazırlık zarfındaki istenmeyen zaman kaybını engellemektir. Bilimsel makale yazılırken birçok hata yapılabilir. Bir bilimsel makale her bölüme daha fazla dikkat edilerek hazırlanmalıdır. Makale için yayımlanmış bazı kurallar olsa da tam olarak ne ifade etmek istediğini makalede yeterince açıklayabilmek için yazarın iyi grameri olmalıdır. Bu çalışmamızın yeni yazarların nispeten daha iyi makaleler hazırlamasına yardımcı olacağını ve sıklıkla yapılan yanlışları belirterek makale hazırlanması esnasındaki zaman kaybını minimize edeceğini düşünmekteyiz.

Anahtar Kelimeler: Bilimsel makale, Yazma, Yayımlama

Introduction

The scientific article is the printed report that describes the outcomes of the authentic studies. Scientific progress can be achieved with studies. Sharing the results of studies and experiences by presenting rare cases is only possible through the articles published in scientific journals (1). Studies find their value only by publishing, if they reach conclusions. Thus, Gerard Piel's statement "Without publication, science is dead" explains this very well. Namely, if you do not publish your work, it has no meaning in the world of science (2). Turkish proverbs such as "Wisdom exists with the pen" and phrases like "Words fly away, writings remain" are the answers for "Why should science be published?"

One of the common problems encountered by young researchers is the subject of "How to prepare a scientific article?" (3,4). Hence, embalming the dead is easier than writing an article about it for some, as Paul Silvia stated (5). Before starting to write an article, setting up your daily plans and appointments are recommended. One-2 hours daily should be reserved for writing the article. First of all, it is necessary to ask the questions shown in Table 1 for the publication. Once these questions are answered, you can begin writing. References should be studied carefully for fundamentals and literature reviews. Today, the internet is frequently used for reference scanning. It is possible to reach references from many internet sites such as Pubmed, Google Scholar, Research Gate, IEEE Xplore, ISI Web of Knowledge, the

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ACM Digital Library, Scopus, CiteSeerX, arXiv, and DBLP (6).

Scientific articles consist of four sections (7). A widely accepted format "IMRaD" which is a scientific writing structure includes four or five major sections: introduction (I), methods (M), results (R), and (a) discussion (D) (8). However, not including the topic, abstract and authors' names is a drawback of this format. The IMRaD form should be able to respond to the questions listed in Table 2 (5). The simplicity and clarity in article writing require choosing the most suitable words to convey the right thought. Providing clarity makes it easier to understand. The use of simple and short words instead of complex words that have the same meaning increases the understandability of the article (9).

Writing Article

Title

It is important that the title is a label. Simple and clear words should be used when the title is being planned (10). Keep in mind that the best titles are short (11). A good title is a few words long (12). The title should not be in the form of question, if possible.

Writing and Sorting the Authors' Names

The preferred spelling for the authors' names is the first letters of the first and middle name then the surname. Scientific journals usually do not include the titles and grades after the author's name, but some medical journals may. Titles are often given following the name and grade or in the footnote on the title pages in medical publications (13). The first author should be designer and conductor of the study (14).

Table 1. Questions to ask before article preparation (5)

1. What is the issue and aim of my article?
2. Why is this article important?
3. How could I prepare the hypothesis?
4. What are the findings?
5. What is the most significant result?

Table 2. Questions to ask in IMRaD format (5)

Introduction	Materials and methods	Results	Discussion and conclusions
1. Why is this research important?	1. Which materials should we use?	1. What are our major results or findings?	1. What are major results of the research?
2. What is known about the issue?	2. Who are the subjects of our research?	2. What are our supportive findings?	2. What is the implication or significance of our findings?
3. What are the hypotheses?	3. What is the design of our research?		
4. What are the aims?	4. Which ways should we follow?		

IMRaD: Introduction, methods, results and discussion

Abstract

Abstract is considered as a looking-glass of the article. Certainly, the most viewed section of an article is abstract both in journals and electronic literature searches. The abstract should be organized in such a way as to draw the attention of the reader, especially to the objectives, design, outcomes, and conclusion (15). Two principles are important should the authors want to use concise language to sum up the article: first the summary needs to be apparent enough for those who will not view the rest, and second, it needs to be short; word restriction in journals differs (3). Indicating the keywords at the end of the summary briefly explains the concepts covered by the article.

Introduction

The introduction is a critical part as it establishes the approach of the reader and reviewer. It is better if the introduction has two segments, preferentially in two paragraphs. Of these paragraphs, the first one may clarify and sum up the background information that constitutes a basis and explains the necessity for the study, and the new information that the study intends to demonstrate. The reader should be convinced that the study is established on a solid ground with reasonableness. The objective or hypothesis of the study may be described in the second paragraph (3).

Materials and Methods

"Materials and Methods" is traditionally reported to be the easiest to write. Even though it is known to be the easiest, it also causes nearly 30% of the rejections alone. The following must be specified at the beginning of this part (16):

1. The date on which the study was conducted,
2. The number of cases included in the study,
3. Whether or not ethics committee approval has been granted,
4. Whether it was a prospective or retrospective study.

After that, the questions listed in Table 2 should be answered (5). The choice of experimental or observational samples should be clearly defined; for example, the type, gender, sex, weight or physiological status of the experimental animal used in an experimental study should all be specified.

In clinical trials, details, such as the selected population of patients, the inclusion of patients, or the reasons for exclusions should be explained. If used, materials should be parameterized such as chemical composition, trade name, company name, and country of origin. It should be clearly stated how the study was designed and the procedures were followed (17,18).

Results

As shown in Table 2, initially the most important findings, then the supportive findings should be mentioned. All data should be presented in an understandable manner in this section. The results can be highlighted in tables, charts, or figures to make it more understandable. Data shown in a table does not need to be mentioned in detail in the text as well, which may make it harder for the reader and the reviewer to understand (19). However, it may be useful to mention the featured data in the text. In addition, statistical evaluation of the study should be covered here. Data interpretation is not for the results section but the discussion section (20,21). Only the data disclosed in this section may be addressed in the introduction or discussion section. If data is obtained using small numbers, exact numbers should be specified, not percent values. Additionally, unexpected results obtained in the study are often as valuable as expected findings; therefore, they should also be marked.

Discussion

Each study has its unparalleled findings and results; therefore, the discussion section may vary in its structure, shape or length. Placing your findings in the context of your study and explaining the meaning of these findings and their importance without appearing patronizing, condescending or arrogant should be the purpose of "discussion section" (22). Major findings of the study should be indicated. By the way, unexpected findings can be explained and discussed (23). According to the results of the study, implications must be made.

That is to say, the discussion section should roughly include the following (3):

1. Basic findings and new information presented by the current study need to be clearly stated,
2. The strengths and weaknesses need to be addressed,
3. Data of the study need to be compared with the findings of studies conducted previously,
4. Resemblances and discrepancies with the previous studies need to be described,
5. Possible explanations need to be made for different findings,
6. The study needs to be clearly and briefly concluded that it is related to clinic, practice, or future research,

7. Suggestions need to be made for future research.

Conclusion

Last paragraph should include brief summarizing or concluding sentences indicating the importance of the article. This way, at the end of the article, the reader may have a clear idea of what this information will do (24).

Acknowledgement

People and institutions assist in the conduct of the study or writing of the article (such as control, statistical or monetary contribution in terms of grammar and language) should be thanked in this section (1,25).

Disclosure

Since journals generally have hard rules about disclosure, if there is a suspicious data or contradiction in the study, it should be remarked. (18). By the way, authors should highlight the limitations of their study (26).

References

Scientific studies are ethically inclusive for they are based on authenticity and reliability. Only the published references can be cited. Although there are many ways of showing references, many journals give the references in one of three general models. They are usually categorized by number according to "name and year", "alphabetical list number" and "cited order" (13,20). The ideal number of references varies between 20 and 40, but many journals do not accept more than 25 references. The reference listing is an important part that will increase your paper's chances of being accepted. Because the editors often use authors listed here as commentators. This is normal because authors in references with similar works are considered expert (3). The sources from the journals indicated differently than the ones from congress paper, personal interviews, and internet sites. The lack of mention of the cited reference leads to plagiarism, one of the basic subjects of scientific ethics. Plagiarism is claiming someone else's article or thought as author's own. There is no place for plagiarism in an authentic and reliable scientific article (27).

Computer programs such as, Endnote, Zotero and Mendeley may help writing references (28). The most common reference styles are the Harvard and the Vancouver systems. The reference is indicated with author's name and year of publication and reference section is arranged alphabetically in the Harvard system. However, in the Vancouver system, references are arranged numerically and reference section arranged numerically. Medical journals and theses tend to use the Vancouver system and the Harvard system, respectively (29).

Publication of Article

Sending Manuscript and Choice of Journal

Ask someone with knowledge about the subject to review and, if necessary, edit your manuscript before submitting it. All co-authors should also examine the manuscript. Take their suggestion into account, but keep in mind that it is not a necessity to accept all. After these, you should decide which journal to send your manuscript to. It is useful to check previous issues of the journal to see if similar papers have been accepted. You should choose the journal with higher impact factor. The selected journal's instructions to the authors should be carefully followed (30). Reviewers pay particular attention to important criteria for acceptance of manuscripts. Therefore, importance and timeliness of the subject, writing style of the manuscript (well-written, apparent, simple to read and reasonable), design (appropriate, rigorous, and comprehensive), review of the previous data (cautious, focused, and contemporary) and a sufficient sample will play a substantial role in acceptance of your manuscript (31).

Revision and Resubmission

If your paper is declined, do not quit immediately, and plan to send it again (30,32). Less than 25% of the submitted papers are accepted in major scientific journals (33). Therefore, refusal of a paper does not always mean that it is poor. A rejection indicates that the reviewers did not give it a sufficiently high priority. Since you have received important suggestions on how to improve your manuscript, you should not get too disappointed (8). Before sending your paper to next journal, carefully examine the criticisms of the reviewers and try to answer them as much as possible.

According to the experiences of evaluated authors, the most common mistakes are (3):

Unsuitable results.

Power analysis failure.

Insufficient sample size.

Excessive confidence in the negative consequences of sample size.

Statistics performed inadequately.

Since finding one or more comparisons to be statistically significant is only possible by chance, the actual clinical symptom is not accepted when multiple comparisons are performed.

Improper use of the statistical terminology of "multi-variable" and "hypervariable" terms.

Inappropriately reporting of shares and ratios of the shares without any reference.

The possibility of manipulating the study target retrospectively according to positive findings.

Incorrect author names in references. If a writer's name is misspelled and the writer is one of those who originally reviewed, the reviewer can be "closed".

According to the reasons for refusal, the article may be submitted to another journal. If a revision is requested, after completing revisions, the paper may be sent to the same journal again or preferably another.

Conclusion

As a result, writing scientific papers is a laborious and patience-requiring process. However, usually, the effort pays off. Since contribution to science is a contribution to humanity, when the article is published and the journal is a popular magazine, feelings of happiness cannot be described.

Ethics

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: M.T.Ö., Y.Ö., **Design:** M.T.Ö., Y.Ö., **Data Collection or Processing:** M.T.Ö., **Analysis or Interpretation:** M.T.Ö., S.Ü.A., Y.Ö., **Literature Search:** M.T.Ö., S.Ü.A., **Writing:** M.T.Ö., S.Ü.A.

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