

Chapter 12

Publishing a scientific paper

12.1 Introduction

Publication of research work is essential in order to advance science and to improve health. It is also essential for people pursuing a scientific career. Their recognition as researchers depends on their publications and contributions to scientific progress. Scientists live in a culture of “publish or perish”. Researchers should learn not only how to write a scientific paper, but also how to get it published. Scientific journals have technical requirements, and authors should make themselves familiar with these requirements. Researchers deserve to have the credit for their work, but only if they have contributed intellectually to it. Ethical standards apply to scientific publication and should be observed by authors, and ensured by editors.

12.2 How to get your paper published

The editor’s decision to accept or reject a paper is generally based on the following:

- the message of the paper: how clear, important and new is the message?
- the relevance of the paper to the journal’s scope and its audience; the journal’s backlog of accepted papers is also a factor in the consideration;
- scientific validity of the evidence supporting the paper’s conclusions;
- quality of the manuscript.

The message

The paper must have a message. A good message can be put in one sentence. Some journals now require this one sentence, beneath the title of the paper, in order to put it in the table of contents. A second issue is the “so-what” test: Do the findings have implications? Whether a journal accepts a paper often hinges on whether its message is new, expands on, confirms or rejects a previously published message.

Matching the topic and the journal

A decision on which journal to submit the paper to must be made before the paper is finally written. The paper must be written in conformity with the style of the journal. The list of journals indexed in PubMed/MEDLINE of the US National Library of Medicine includes over 2600 peer-reviewed journals grouped by subject field. A peer-reviewed journal is one that submits most of its published articles for review by experts who are not part of the editorial staff. It is important to ensure that the topic of the paper falls within the scope of the journal selected. The format of the paper should also be one that is accepted by the journal.

High prestige journals have high rejection rates, sometimes as high as 90%. Rejection does not necessarily mean that the paper is not good. Journals cannot publish all the good papers they receive. For the authors, rejection means loss of weeks or months before the paper is submitted again to another journal. Publication lag is the interval between acceptance and publication; the average lag is seven months. Even so, it is not acceptable to send the same paper simultaneously to more than one journal. The journal considers the paper on the assumption that it has not been submitted elsewhere. Among the principal considerations that have led to this policy are the potential for disagreement when two journals claim the right to publish the same manuscript, and the possibility that two or more journals will unknowingly and unnecessarily do the work of peer review and editing of the same manuscript, and even publish the same article.

A single paper is more likely to be accepted than one in a series. (Arbitrary carving up of clearly related aspects of one study is referred to as “salami science” and is not encouraged.)

Scientific validity

Internal validity refers to the degree to which the investigator’s conclusions correctly describe what actually happened in the study. It means that within the confines of the study, results appear to be accurate, the methods and analysis used stand up to scrutiny, and the interpretation of the investigators appears to be supported.

External validity (also called generalizability) refers to the degree to which the findings of the study may be generalized to the population from which the sample for the study was drawn. Poor methods and inadequate results are most often responsible for rejection.

Quality of the manuscript

This has been discussed in detail in Chapter 11.

12.3 Uniform requirements for manuscripts submitted to biomedical journals

A group of editors of general medical journals met informally in Vancouver, British Columbia, Canada, in 1978 in order to establish guidelines for the format of manuscripts submitted to their journals. The group became known as the Vancouver Group. Its requirements for manuscripts, including formats for citing bibliographic references, were first published in 1979. The Vancouver Group expanded and evolved into the International Committee of Medical Journal Editors (ICMJE), which meets annually, and has gradually broadened its concerns.

The Committee has produced several editions of the Uniform Requirements for Manuscripts Submitted to Biomedical journals: Writing and Editing for Biomedical Publication. Over the years, issues have arisen that go beyond manuscript preparation. Some of these issues have been covered in subsequent editions; others are addressed in separate statements. Each statement has been published in a scientific journal. In the latest revision (November 2003), the committee revised and re-organized the entire document and incorporated the separate statements in the text (<http://www.icmje.org>). The total content of the Uniform Requirements for Manuscripts Submitted to Biomedical Journals may be reproduced for educational, not for-profit purposes without regard for copyright. The Committee encourages distribution of the material.

The Uniform Requirements are instructions to authors on how to prepare manuscripts, not to editors on publication style. (But many journals have drawn on them for elements of their publication styles.) If authors prepare manuscripts in the style specified in these requirements, editors of the participating journals will not return the manuscripts for changes in style before considering them for publication. In the publishing process, however, a journal may alter accepted manuscripts to conform to details of its publication style. Authors sending manuscripts to a participating journal should not try to prepare them in accordance with the publication style of that journal but should follow the Uniform Requirements.

Authors must also follow the instructions to authors in the journal as to what topics are suitable for that journal and the types of papers that may be submitted, for example, original articles, reviews or case reports. In addition, the journal's instructions are likely to contain other requirements unique to that journal, such as the number of copies of a manuscript that are required, acceptable languages, length of articles, and approved abbreviations.

Participating journals (over 500 internationally) are expected to state in their instructions to authors that their requirements are in accordance with the Uniform Requirements for Manuscripts Submitted to Biomedical Journals and to cite a published version.

The following sections are largely based on these uniform requirements.

12.4 Summary of technical instructions for submission of papers

Type or print out the manuscript on white bond paper, 216 × 279 mm, or ISO A4 (212 × 297 mm), with margins of at least 25 mm. Type or print on only one side of the paper. Use double-spacing throughout, including for the title page, abstract, text, acknowledgements, references, individual tables, and legends. Number pages consecutively beginning with the title page. Put the page number in the upper or lower right-hand corner of each page. Begin each section or component on a new page

Place each table on a separate page. Illustrations and unmounted prints should be no larger than 203 × 254 mm. Authors should submit the required number of paper copies and are advised to keep copies of everything submitted.

The title page should carry:

- title of the article, which should be concise but informative;
- name by which each author is known, with his or her highest academic degree(s) and institutional affiliation;
- name of the department(s) and institution(s) to which the work should be attributed;
- disclaimers if any;
- name and address of the author responsible for correspondence about the manuscript; the name and address of the author to whom requests for reprints should be addressed, or a statement that reprints will not be available from the authors;
- source(s) of support in the form of grants, equipment, drugs, or all of these;
- short running head or footline of no more than 40 characters (count letters and spaces) at the foot of the title page.

An increasing number of journals require electronic submission of manuscripts, whether on disk, as attachment to electronic mail, or by downloading directly onto the journal website. Electronic submissions save time as well as postage costs, and allow the manuscript to be handled in electronic form throughout the editorial process, for example when it is sent out to reviewers. Authors can follow the course of their paper by accessing the website of the journal. Authors should consult the journal's instructions to authors for acceptable word processing formats, conventions for naming files, and other details.

When paper manuscripts are submitted, journals commonly require authors to provide a copy in electronic form (on a disk) when the papers are close to final acceptance. The disk should be clearly labelled with the format of the file and the file name.

12.5 Sending the manuscript to the journal

The required number of copies of the manuscript should be sent in a heavy-paper envelope, enclosing the copies and figures in cardboard, if necessary, to prevent the photographs from being bent. Photographs and transparencies are better put in a separate heavy-paper envelope.

Manuscripts must be accompanied by a covering letter signed by all co-authors. This must normally include:

- information on prior or duplicate publication or submission elsewhere of any part of the work;
- a statement of financial or other relationships that might lead to conflict of interest;
- a statement that the manuscript has been read and approved by all the authors, that the requirements for authorship have been met, and that each author believes that the manuscript represents honest work; and
- the name, address, and telephone number of the corresponding author, who is responsible for communicating with the other authors about revisions and final approval of the proofs.

The letter should give any additional information that may be helpful to the editor, such as the type of article in the particular journal that the manuscript represents and whether the author(s) would be willing to meet the cost of colour illustrations.

Copies of any permission to reproduce published material, to use illustrations or report information about identifiable people, or to name people for their contributions must accompany the manuscript.

A transfer of copyright may be required at this stage, or after the paper has been accepted for publication.

12.6 After submitting the manuscript

Acknowledgement of receipt of the manuscript is usually received within 2–3 weeks. A decision regarding publication is usually made within 6–8 weeks, depending on

reviewers' responses. Rejection rates of the best journals are over 50%. Probably only 5% or so of papers are accepted without change recommended as a result of peer review.

The reviewers' responses may suggest that that the paper can be made more acceptable by revisions. The investigators do not need to make all the changes suggested automatically. They should adopt revisions that will satisfy the reviewers' criticisms wherever possible and justify any decision not to do so. It is good to indicate in a separate page the criticism made and how the revised paper responds to them. This will facilitate a decision by the editor.

12.7 Authorship in scientific papers

An "author" is generally considered to be someone who has made substantial intellectual contribution to a published study. The International Committee of Medical Journal Editors issued the following guidelines about authorship.

- Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.
- Authorship credit should be based on substantial contributions to:
 - (1) conception and design, or acquisition of data or analysis and interpretation of data; and
 - (2) drafting the article or revising it critically for important intellectual content; and
 - (3) final approval of the version to be published.Authors should meet conditions 1, 2 and 3.
- Acquisition of funding, collection of data or general supervision of the research group does not justify authorship.

To provide information on the work done by authors and to resolve the inconsistency between the information provided for those named in the byline versus those listed in the acknowledgements, some journals require authors to indicate the specific contributions of all those involved. Consequently, authors are required to describe their specific contributions as well as the contributions of those acknowledged but not listed in the byline. While many individuals may contribute to the work of an article, the contributors must decide for themselves what their contributions have been, and what level of contribution merits a place on the by-line. It is suggested that those in the by-line should be listed in order of actual contribution made, as decided by the authors.

Any contributors who do not meet the criteria for authorship should be listed in the acknowledgement section. Because readers may infer their endorsement of the data and conclusions, all persons listed must give written permission to be acknowledged.

12.8 Patents and publication

There is a growing understanding of intellectual property rights by academics and scientific institutions. The importance of the issue has already been discussed in Chapter 10. It is accepted that a private or public sponsor of the study has the right to review a manuscript for a defined period (for example 30 to 60 days) before publication to allow for the filing of additional patent protection if required. However, the sponsor must impose no impediment, direct or indirect, on the subsequent publication of the full results of the study.

12.9 Ethics in scientific publication

12.9.1 Credit

Researchers must get the credit for the research they have carried out. However, as explained in section 12.7, no one should get credit without having actively participated in the research. All authors should agree to have their names on the paper, and to take public responsibility for it. The order of authors should be by agreement among the authors.

The work of previous investigators on the topic in question should be cited. The investigator should not claim credit for an idea that has already been put forward or studied by others, and should indicate previous studies that may have shown different results and conclusions.

The contribution of others who have helped in the implementation of the research should be acknowledged, and the source of support for the research should be identified.

12.9.2 Respect of copyright

Copyright should be respected. The principle behind the copyright law is relatively simple. Copyright begins at the time a creative work is recorded in some tangible form. In scholarly work, there is seldom a financial compensation for copyright, as in other fields, but there is certainly the need for recognition. No figure or table from previously published work should be included without written permission from the publisher and author. Full credit to the source should be included in the paper (“Reproduced with permission from...”).

Plagiarism is a major ethical offence. Using and claiming the words or ideas of another person as one’s own, without acknowledging their contribution, is not acceptable.

12.9.3 Conflict of interest

“Disinterestedness” is a norm of science. When investigators have vested interests in the research, this should be explicitly disclosed. A statement on conflict of interest is now required by many journals before considering a paper for publication. As commerce and academia work closer together, there is the potential for financial and funding ties to distort the work. Some studies which reviewed published reports of clinical trials have suggested that clinical trials were more likely to reach conclusions that were favourable to the intervention, when supported by for-profit organizations (Als-Nielsen, 2003).

12.9.4 Redundant or duplicate publication

Redundant or duplicate publication is publication of a paper that overlaps substantially with one already published by the same authors.

Readers of primary source periodicals should be able to trust that what they are reading is original unless there is a clear statement that the article is being republished by the choice of the author and editor. This position is based on international copyright laws, ethical conduct and cost-effective use of resources.

Most journals do not wish to receive papers on work that has already been reported in large part in a published article or is contained in another paper that has been submitted or accepted for publication elsewhere, in print or in electronic media. This policy does not prevent the journal from considering a paper that has been rejected by another journal, or a complete report that follows publication of a preliminary report, such as an abstract or poster displayed for colleagues at a professional meeting. Nor does it prevent journals from considering a paper that has been presented at a scientific meeting but not published in full, or that is being considered for publication in proceedings or similar format.

When submitting a paper, the author should always make a full statement to the editor about all submissions and previous reports that might be regarded as redundant or duplicate publication of the same or very similar work. The author should alert the editor if the work includes topics about which a previous report has been published. Any such work should be referred to and referenced in the new paper. Copies of such material should be included with the submitted paper to help the editor decide how to handle the matter.

If redundant or duplicate publication is attempted or occurs without such notification, authors should expect editorial action to be taken. At the least, prompt rejection of the submitted manuscript should be expected. If the editor was not aware of the violation and the article has already been published, then a notice of redundant or duplicate publication will probably be published with or without the author’s explanation or approval.

Acceptable secondary publication

Secondary publication in the same or another language, especially in other countries, is justifiable and can be beneficial, provided all of the following conditions are met.

- The authors have received approval from the editors of both journals; the editor concerned with secondary publication must have a photocopy, reprint or manuscript of the primary version.
- The priority of the primary publication is respected by a publication interval of at least one week (unless specifically negotiated otherwise by both editors).
- The paper for secondary publication is intended for a different group of readers; an abbreviated version could be sufficient.
- The secondary version carefully reflects the data and interpretations of the primary version.
- The footnote on the title page of the secondary version informs readers, peers and documenting agencies that the paper has been published in whole or in part and states the primary reference. A suitable footnote might read: “This article is based on a study first reported in [title of journal with full reference].”

Permission for such secondary publication should be free of charge.

12.9.5 Protection of patients' rights to privacy

Patients have a right to privacy that should not be infringed without their informed consent. Identifying information should not be published in written descriptions, photographs and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) gives written informed consent for publication. Informed consent for this purpose requires that the patient has the right to be shown the manuscript to be published.

Identifying details should be omitted if they are not essential, but patient data should never be altered or falsified in an attempt to attain anonymity. Complete anonymity may be difficult to achieve, and informed consent should be obtained if there is any doubt. For example, masking the eye regions in photographs of patients is inadequate protection of anonymity.

The requirement for informed consent is normally included in the journal's instruction for authors. When informed consent has been obtained it should be indicated in the published article.

12.9.6 Release of results to public media

Researchers should look for recognition primarily among their peers. It is not considered ethically acceptable for researchers to break news of their findings to the public or the media before they have been communicated to their peers in scientific press or meetings. Preliminary release of scientific information described in a paper that has been accepted but not yet published violates the policies of many journals. In exceptional (and rare) cases, and only by arrangement with the editor, preliminary release of data may be acceptable, for example, if there is a public health emergency. Some journals issue press releases about important findings to coincide with publication.

12.9.7 Scientific fraud

Research misconduct can be regarded as a continuum ranging from errors of judgement (that is, mistakes made in good faith) such as inadequate study design, bias, self-delusion and inappropriate statistical analysis, to what may be regarded as misdemeanours (also called “trimming” and “cooking”) such as data manipulation, data exclusion, suppression of inconvenient facts, through to blatant fraud, usually categorized as fabrication, falsification and plagiarism (Farthing, 1998). The culture of science is based on trust. When a researcher presents his/her data in public, the data are taken at face value. One may interpret data differently, question the study design or disagree with the statistical analysis. However, if we cannot trust the data, the whole atmosphere of science is poisoned. There is also the impact on the public. Every single case of fraud and misconduct reduces public confidence in science. It also indicates that public and charitable funds may have been abused. Cases of scientific fraud are causes for embarrassment and frustration to the vast majority of honest scientific researchers.

In the United Kingdom, a Committee on Publication Ethics (COPE), made up of medical journal editors was established in July 1997, some two years after a senior gynaecologist was struck off the medical register by the General Medical Council for fabricating evidence that was published, including a claim to have successfully relocated an ectopic pregnancy and also a three year trial of a hormone treatment for recurrent miscarriage. Neither the relocated ectopic pregnancy nor the trial had ever taken place. Information about the work of COPE and its periodic reports is available on the internet (<http://www.publicationethics.org.uk>)

12.9.8 Ethical responsibility of journal editors

Editors should take all reasonable steps to ensure the accuracy of the material they publish. Whenever it is recognized that a significant inaccuracy, misleading statement or distorted report has been published, it must be corrected promptly and with due prominence. If articles prove to be fraudulent or contain major errors that are not

apparent from the text then they should be retracted—and the word retraction should be used in the title of the retraction (to ensure that it is picked up by indexing systems). Cogent critical responses to published material should be published unless editors have convincing reasons why they cannot be. Some journals have created electronic means of responding, so that “lack of space” will not be a reason for not publishing a response. Editors should ensure that research material they publish has been approved by an ethics committee. In addition, they should satisfy themselves that the research is ethical as they can be held responsible for publishing “unethical” research even if it has been approved by an ethics committee.

Editors must protect the confidentiality of information on patients obtained through the doctor–patient relationship. If ensuring anonymity is not completely possible, written consent for publication from patients should be obtained.

References and additional sources of information

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