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Writing a model research paper: A roadmap

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Full Text

Introduction

Publishing in biomedical journals is considered as a scholarly activity and merits academic credit. [1],[2] The issue of publications has come to forefront ever since the Medical Council of India (MCI) has mandated two research publications in certain indexed journals for each step of promotion of medical faculty. [3],[4],[5],[6],[7] This has led to many medical teachers who are due for promotion trying to achieve their publications' target. Publication is essentially writing up a report of a research study in a "particular" format for a "particular" scientific journal. In general, one should try to publish in an easily accessible, widely read, and prestigious indexed journal. Regularly reading and analyzing research articles in one's own specialty in various journals helps in learning how to write manuscripts. [8] Mentoring by successful and seasoned authors can ease the task of publications for the beginners. [1],[4] In addition, attending research methodology and writing workshops/trainings in medical writing helps beginners in

learning the ABCs of writing medical manuscripts.[4],[5],[9] Improvement in institutional support and infrastructure can improve research output and aid in improving the quality of publications.[4],[5] This editorial attempts to offer useful tips for the prospective authors to get their research papers published in eminent peer-reviewed journals (which have a high standing in the academic field) with a greater success rate.

Preparing the Manuscript

The basic IMRaD (Introduction, Methods, Results, and Discussion) structure is maintained by all journals while publishing original research.[2],[9],[10],[11] The draft of the manuscript consists of the title page (including the acknowledgments and disclosures), abstract and keywords, main text (introduction, methods, results, and discussion), references, tables and figures, and the legends to figures.[1],[2],[9],[12]

Title page

The title page gives the title, names of all the authors, author affiliations (and highest degree), institution where the work was done, author emails, author contributions, funding/support for the research, conflicts of interest, the name and address/contact of the corresponding author, short title/running head, word counts of text and abstract, the number of tables and figures, and the acknowledgments. The title page is submitted as a separate file to prevent identifying the authors and institution (by the reviewers and editorial board members) during the review process.

Title of the research paper

Since the research paper's "title" is the first one to be read (in the table of contents of a journal), it needs to be attractive.[1],[13] It needs to provoke curiosity and it should accurately convey what the paper is about.[1],[10],[13] At the same time, it needs to be simple, concise, and easily understood without jargon.[13] This exercise should preferably be done at the end of drafting the paper. Some journals mandate that the study design (randomized, crossover, observational) should be included in the title itself.

Criteria for authorship

Authorship is the "currency" of academic life and it should be conferred with great responsibility. [2],[13] Only those who have made substantial scientific contribution (doing the research as well as writing the paper) qualify to be authors.[1],[2],[13],[14] The International Committee of Medical Journal Editors (ICMJE) has expressed that all four of the following criteria should be satisfied to qualify for authorship:[2]

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

All the individuals who meet the first criterion should have the opportunity to participate in the review, drafting, and final approval of the manuscript so that they qualify for authorship and get the credit for their contribution.[2] Thus, the ICMJE criteria should not be used for disqualifying colleagues from authorship by denying them opportunity to meet criteria 2 and 3.[2]

Accountability is not only for the part of the work that an individual author has done, but also every author should be able to identify which co-author(s) are responsible for specific other parts of the work.[2] In addition, every author should be assured of the contributions of the co-authors.[2] The above principles apply to both the primary draft and all the subsequent revisions that the paper would undergo. Authorship is the responsibility of all authors, and "gift authorships" as well as "ghost authors" are ethically incorrect.[10],[13],[15] The author order should be decided early in the course of the research itself.[1],[2],[13] One cannot delete or add an author after submission of the paper.[1],[2] Editors would find this practice disappointing and will insist on appropriate explanation.[1],[2] Many journals now publish the exact contribution that each author has made to the research (and writing) and ask to state the "guarantor" for the study.[1],[2],[13],[15] The "guarantor" is usually the principal investigator of the research study.

Corresponding author

The corresponding author (who need not be the guarantor) is primarily responsible for submission, coordinating the revision(s), fulfilling the administrative requirements (conflict of interest forms, copyright forms, and preserving ethics permission) as well as coordinating the postpublication queries.[2] A middle-cadre faculty/investigator with experience in publishing should take up this responsibility as a nascent author may not know how to effectively deal with editors and reviewers while the senior author may not have the necessary time to spare. Needless to say that conflict of interests (financial/commercial supports, grants, personal relations/rivalries, academic competition) need to be declared by every author (on the title page).[1],[2] The important role that the corresponding author plays in the publication process has been duly recognized in the recent Government of India (MCI) gazette amendment notification (dated June 5, 2017 – No. MCI-12 (1)/2017-Med. Misc./115698), which states that only the first author or the corresponding author will get the credit of a research publication for the purpose of promotion.[16]

Acknowledgments

Other members of the research team who have helped in doing the study but who do not satisfy all the four authorship criteria are the ones who need to be acknowledged. These include financial support, departmental chair, administrative support, help in technical/language editing, material help, writing assistance, and help in proofreading.[1],[2],[13],[15] The acknowledgment has to be done in a separate paragraph specifying the role of the acknowledged person with written permission from the person to be acknowledged.[2] Some journals place the acknowledgments' section after the main text (i.e., just before the references) in the final published paper. Not mentioning the people who qualify to be acknowledged would be ethically incorrect.

The abstract

The abstract is a concise and accurate summary (of about 250 words) of the paper.[1],[2],[10],[13] It is an independent (stand-alone) and structured summary (background, aims, methods, results, and conclusions) which is read carefully by the editors to choose the reviewers.[2],[13] It would be included in all abstracting services (where the journal is listed) and helps readers browse and often decide on whether they wish to read the contents of the paper.[10],[13] The abstract is the second most common part read after the "title" and needs to reflect the content of the article accurately without any disagreement with the text (especially after a revision).[2],[13] The keywords (three to ten key words or short phrases that capture the main topic) follow the abstract and should be terms mentioned in the Medical Subject Headings list (<https://meshb.nlm.nih.gov/search>).

The introduction

The introduction should be brief (up to 150 words) and consists of the rationale for the study, adequate background information (context to allow a reader to understand and evaluate need for the study without referring to previous published work), and should state the research question and the aims.[1],[2],[10],[11],[14] This section needs to be concise and not unduly elaborate.

The methods

The methods section needs to answer three questions - What has been done? How was it done? and What did the authors look for? It should be organized in a meaningful way to provide sufficient details for the work to be replicated by other interested researchers. The methods section consists of ethical aspects (permission from ethics committee and institutional review board, consent, and assent), description of the study setting, participants, design, treatments/procedures/interventions, end points, and outcomes.[1],[2],[10],[11],[14] The statistical methods employed for various variables and the software package used should also be mentioned here.[1],[2],[10] The authors should preferably get this section checked by a biostatistician to ensure that it accurately describes the statistics used in their paper. In addition, the authors should have ensured that their study is registered in the Clinical Trials Registry-India (CTRI) [www.ctri.nic.in] before enrolling the first patient.[17] The CTRI website states that "today, any researcher who plans to conduct a trial involving human participants, of any intervention such as drugs, surgical procedures, preventive measures, lifestyle modifications, devices, educational or behavioral treatment, rehabilitation strategies as well as trials being conducted in the purview of the Department of AYUSH (<http://indianmedicine.nic.in/>), is expected to register the trial in the CTRI before enrollment of the first participant." [17]

The results

The results section essentially answers the question - What did the authors find? Hence, the results section consists of answers to all points raised in methods, results for all end points (in a logical sequence), reporting of actual P values with the 95% confidence intervals, accounting for all observations as well as using tables and figures judiciously.[1],[2],[10],[11] The authors should not include any new parameters that are not mentioned in the methods section and must avoid nontechnical uses of statistical terms (such as random, correlate, significant, and sample). [1],[2],[10],[11] Most journals provide facility for uploading of supplementary files if the results are vast or lengthy.[2] These supplementary files undergo the review process and may be "e-published" on the website of the journal (instead of the print journal).[2] The authors should

note that precise facts are best mentioned in the text section and in tables. However, graphs and illustrations (wherever indicated) should be included as they arouse interest and create a unique impact.

The discussion

The discussion section is used to put the study results into proper perspective. Hence, in this section, one should state the meaning of the main findings in text form without mentioning the details of the actual numbers or percentages or P values (as these have already been stated in the results), harp on the new and important aspects of the study, compare with previous similar research, explore plausible explanations for conflicting results, discuss the practical implications, and clearly state the limitations and biases in the study.[1],[2],[10],[11],[14] Finally, the authors should mention the main conclusion of their study (briefly). This is followed by a short paragraph wherein the authors can explore the generalizability of their findings, give a take-home message, and suggest directions for further research.[1],[2],[11] A re-review of literature may be required if the original review of literature was done some time ago to include recent publications as references.[9] The authors should write the discussion in their own language after interpreting the earlier papers so that even accidental "plagiarism" is prevented. Authors should check their final manuscript on iThenticate ® (or any other similar software before submission) and must ensure that their manuscript's "similarity index" does not cross the upper limit of 20%.[18] In case the similarity index crosses 20%, it is possible that an editor may find this unacceptable and reject the manuscript.[18] Some free websites which an author can use to check the similarity index of their manuscript (to avoid plagiarism) include – Plagiarisma (<http://plagiarisma.net/>), Small Seo Tools (<http://smallseotools.com/plagiarism-checker/>), Glatt Plagiarism Services (<http://test2.plagiarism.com/index.html> or <http://www.plagiarism.com/>), Duplichecker (<https://www.duplichecker.com/>), and Search Engine Reports.net (<https://searchenginereports.net/plagiarism-checker>).

The references

The references' section comes next. The authors should ensure to conform to the style of the journal (Vancouver or Harvard or other styles of referencing) and cite pertinent references (those that support or contradict the study conclusions/experience).[1],[2],[19] It is advisable that most of the references are recent (usually from the past 5 years). One should always stick to the guidelines advocated/restrictions imposed by the journal and double check the references with the full-text articles (as the references need to be accurate and complete).[1],[2],[19] The authors need to ensure that all references are cited in the main text.[9],[19] The references should be written accurately as they get quoted in the manuscript and their numbering can be finalized later. Carelessly written references create a very poor impression of the manuscript with the journal editors and reviewers.

Tables and artwork

All the tables and figures (photographs/illustrations/images/graphs/charts) should be numbered consecutively, identified in the main text (results' section), have a title/legend, and should be understood independently (i.e., without referring to the main text).[1],[2] One should not duplicate the data mentioned in the text again in the figures or tables.[2],[11] The authors should be very careful regarding the quality (size, clarity, pixels, and format - jpeg/bmp/tiff) of

the photographs, images/graphs/charts, and illustrations (the “artwork”) and these files need to be separately uploaded for most journals.[1],[2],[10],[14] The authors need to remove all patient-identifying information and take a written consent from the patient for publishing photographs or videos (irrespective of whether the identity of the patient is revealed or not).[2],[9] The authors also need to stick to the limits on the number of figures (imposed by the journal), and explanatory notes are to be placed as “legends” at the end of the manuscript.

Adhering to the instructions to authors

All the above guidelines and the necessary subtle/individual variations are given in the “instructions to authors” issued by the respective journals.[2],[10],[11],[14] They include scope of the journal, types of manuscripts published, specific requirements regarding authorship and referencing style, details of artwork and images/photographs/illustrations, word counts, review process, and the charges for pages, extra tables and extra figures.[2],[14] All nonstandard short forms need to be identified in full form in the main text before reusing them in the manuscript. [1],[2],[9],[14] All borrowed materials should be accompanied with the line of credit to the copyright holder, a signed consent from the copyright holder (to use/modify their material) has to be kept ready, and the consent should be uploaded to the journal manuscript submission website (whenever it is asked for).[2],[9]

The writing order

A logical writing order for a research paper for most of the authors would be to first write the methods and results, followed by the introduction and discussion, and finally the abstract and the title.[1],[13],[14] The authors should retain all the original electronic files for future reference and preserve the primary data files and analysis for at least 10 years after the publication.[2],[9]

Conclusions

The authors should remember that editors are looking for high-quality research publications with new knowledge relevant to the scope of their journal.[9],[12] Editors require clear and concise information in a logical sequence (avoiding repetitions) in their own “journal style” with correct use of English grammar and spellings.[1] Detailed guidelines for reporting are available such as the CONSORT for randomized trials, STARD for studies of diagnostic accuracy, STROBE for observational studies, and CARE for case reports, and all these are available at <http://www.equator-network.org/> [EQUATOR = Enhancing the QUALity and Transparency Of health Research]. The ICMJE (www.icmje.org) gives periodic updated recommendations for authors, editors, and reviewers involved in publication work with the objective to review the best practice and ethical standards in conducting and reporting of research in medical journals, which need to be regularly read.[2] These recommendations should be used along with the individual journal's “instruction to authors” for writing a good paper.[2] In our experience, authors who submit a technically perfect paper for publication stand a better chance with the reviewers to get a favorable recommendation. A carelessly drafted manuscript is more likely to generate an unfavorable recommendation after peer review.

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