

Basic guide to scientific writing

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The Oxford English Dictionary states that scientific method is: "a method or procedure that has characterized natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses."¹ Various fields such as mathematics, medicine and chemistry have variation in the scientific writing styles. Some follow the respective journal guidelines. Others require that the authors write in the present or past tense. In mathematics it is required to write in the present tense. There are guidelines which promote writing in the past tense^{1,2} while others do not recommend it³ Every individual whether a health professional or otherwise, does not have specific training or diploma in the art of writing. Writing skills are developed with practice and reading. It takes enormous patience and dedication to produce a research article of science and significance. However, once it is written and published, the authors' feelings are as if he/she has made one of the greatest achievements of his life and wishes to do more. In this article I am principally addressing the authors who are writing in medical journals. The content should include a very simple, comprehensible text related to the research the authors have done in the hospital, laboratory, in the community or educational institutions. The authors will be describing a story in a scientific manner, i.e. without undue exaggerations, emotions or beliefs, so that individuals related to the respective field can understand the research, reproduce it and above all apply the relevant outcome details in their own respective setting.

The main components of any original research article are Abstract (or summary), introduction, material and methods,

results, discussion (IMRAD: I introduction, M material and methods, R results and D Discussion). Key words or in more scientific terms the words used from the medical subject headings (MeSH) are included at the end of the abstract. Some journals require conclusion with a heading at the end of the discussion. In most manuscripts that are published acknowledgement is optional. Acknowledgment if included is the last section of the main manuscript. References are at the end of the manuscript and majority of the journals require the Vancouver style.⁴ Components of the IMRAD and details of each component can be obtained from any standard text book on medical writing,⁵ or a journal guideline^{6,7} or workshops on medical writing, which are being held on a regular basis at various institutions/ organisations to guide the authors on writing a manuscript. The art of writing cannot be acquired in a day; it requires constant practice and determination to achieve a well written article.

A case report is easier to write and is less scientific, according to some critics.⁸ It describes an unexpected event between disease and symptoms. The case described is original and has not been documented previously. The new information published /provided may help the clinicians to diagnose and manage disease features which they have not come across previously. Case report has the advantage also that it is published rapidly and does not require a large sample size as in a randomised control trial (RCT). However, most journals are reluctant to publish as it can have an adverse effect on the impact factor of the journal.⁹ On the other hand some journals are dedicated to publishing case reports available as open access

e.g. BMJ case report is on line and peer reviewed.¹⁰

A check list should be present with the authors. By this checklist the authors can confirm if they have followed the guidelines of the journal where the manuscript is being submitted, e.g. has the manuscript been scrutinized for the content, language and structure; each component of the manuscript has its particular requirement e.g. the discussion does not contain results and vice versa; the figures are properly labelled; the references are in the appropriate order both in the main text of the manuscript and in the reference section at the end of the paper; above all the guidelines of the journal in which the author is submitting the manuscript is the checklist and should be strictly adhered to.^{6,7}

Style of the scientific paper depends not only on its contents, but also upon the language. The language used should be simple, direct, precise and clear. Unnecessary difficult words should be avoided. Deleting excessive and unnecessary words will improve the grammatical construction and style of expression and facilitate reading with comprehension. Excessive use of the technical terminology should be avoided. Slang words should not be used. The structure of the manuscript is such that the continuity of the theme should be present.

The articles are in the majority of cases written in English. Some journals require UK English and others prefer US English. The appropriate English dictionary software can also be installed in the author's computer. This directs the author to correct and write the English in the appropriate format, acceptable for publication. This method is important as editors and reviewers of the manuscript will easily get irritated if the format of the respective journal is not according to its respective guide lines¹¹ Grammar, punctuation, language and style are important components of medical writing, regardless of the content of the scientific paper being published. The complete article should be written in the same tense, preferably in the past tense as the research is being published after the work has been completed. A consistent use of either singular or plural sense should be used. When for e.g. describing both kidneys they should be referred to as singular or plural. When specific observations are described it should be stated whether one or both the kidneys are affected.

The quality of the manuscript¹² depends upon the study design and accuracy with which the data is collected. These are related to the objectives of the study. Hence a paper written with clarity and evidence based approach, such as in the reporting guidelines of Consolidated Standards of Reporting Trials (CONSORT) statement for RCT has greater chances for publication in a journal of standard repute than a paper not including these important details. Other guidelines included by the EQUATOR Network are STROBE, PRISMA, COREQ, etc. EQUATOR stands for Enhancing the QUALITY and Transparency

Of health Research. Details of which are easily available on line.¹³

The text must be written in the author's own words. Avoid direct quotations. If quoted they should be in inverted commas and with full acknowledgement. Any statement other than the authors own work must be supported by a reference citation. There is no such thing as an assumption in scientific work. An author who copies someone else's work, plagiarises is liable to legal action by the concerned institute/organisation. "Inappropriate authorship or ghost authorship" is not allowed and all authors must realize this important fact and read further to understand the meaning of these terminologies and their implications.¹⁴

The submission of the manuscript can easily be done on line, by following the journal guidelines or it can be submitted as a hard copy by post, to the required journal office. Some journals would require both methods others only one of the two i.e. either on line or by post. Before final submission the manuscript can be shared with a trusted peer colleague for advice regarding the content matter and also for the English grammar if required.

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