



ORIGINAL RESEARCH PAPER

Biochemistry

Writing Introductions Laying Foundation of a Research Paper

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ABSTRACT

The introduction section explains the rationale for undertaking the study and clearly describes the main purpose of conducting it. It should be focused, succinct, legible and crisp. Providing an extensive and detailed literature review, not stating the hypothesis of the objectives with clarity and not providing focused information are some of the authors should steer clear of.

A research study is not completed until one writes it up for a scientific journal. Once the authors choose the journal they intend to submit their manuscript to, it is time to sit down to write the manuscript itself. There is no unanimity regarding the section that should be written first. Some think that it is easier to write the section on methodology first, as one has to only edit what has been written in the protocol. Some advise writing the conclusions first, as they think that authors will then find it easier to align the rest of the article, as per the conclusions drawn. There are still others who prefer penning the abstract first, as they then have to just expand the summary that has been finalized.² We will start the series regarding writing research article with the description of various sections of the IMRaD format (Introduction, Methodology, Result and discussion) in the order that they appear in a manuscript.

The first section of a research article is the 'Introduction'. Almost all journals prefer to have an introduction section for the original research articles. Some journals publish a few research articles as 'Brief Reports' which may not have a designated introduction section. The basic purpose of having an introduction section is to 'sell' the study to the editors and reviewers and to capture the attention of the readers.^{3,4} This section gradually introduces readers to the core parts and hard facts that are presented later⁴. Annesely⁵ aptly describes it as being similar to the process of setting the scene in theatrical productions in which a situation, scene or circumstance is described so that the audience clearly comprehends what is happening. A well-written introduction describes the background and the context, goes on to state deficiencies that exist in knowledge and understanding and then defines what is being planned thereby providing a glimpse of what to expect in the remainder of the article⁵.

Planning the Introduction:-

An introduction generally consists of three components. The first part provides background information; the second part justifies the need to explore the area that is not known while the third component states the hypothesis or describes the purpose and objectives of the study.^{3,6}

Background Information:

This component informs the reader about the topic that is being investigated and discussed. It consists of information about what is known about the issue and provides a gist of work already carried out and reported in the literature. This can be done by providing the salient findings and conclusions of the previously published studies. Then the authors described the unexplored areas, unanswered questions and unresolved issues of the topic. This is generally stated by referring to the paucity of literature on the issue, by providing information about conflicting research findings from various studies, limitations of the previously conducted research⁵ or by monitoring the differences of opinions among expert in the field.

Description of the rationale of the study:

After having described the current situation of what is known and what is unknown, the authors then proceed to convince the reader why it is important to find solutions to the unanswered questions and issues. The importance of filling these knowledge gaps is usually justified on the basis of possibility of determining a mechanism that could open the doors for the discovery of novel therapies and interventions, descriptions of new associations that may aid design new preventive strategies or determining the efficacy and safety of interventions that may reduce morbidity and mortality or improve the quality of life. The authors also use the opportunity to emphasize the new and special aspects of their research. This component of the introduction attempts to convince the reader that it was important to conduct the study that is being described and that novel outcomes can be expected.

Stating the hypothesis and purpose

After having convinced the reader about the need to undertake the study, the authors then state the hypothesis or the purpose or objective of the study. This enables the reader to know about the exact nature of the research question that is being asked and which questions answers to expect by the time the whole article is read.

The language, the length and the depth

The purpose of introduction is merely to introduce the reader to the definition of the problem, justify need for conducting the study and to describe the main theme of the study. Hence, it needs to be focused, brief (a one to two paragraph of introduction good enough for most topics) and crisp. It should not be written to provide a broad review of the information available.^{5,8,9} It is written in the present tense.

Pitfalls that authors stumble into and ways of avoiding them:

Although writing introduction seems straightforward, it is one of the most difficult sections to write in a manuscript. The authors should clear of certain common encountered pitfalls.

Stuffing the introduction with too much of general information:

While preferring for and actually conducting the study, Investigator read a lot on the topic⁴ and while writing the manuscript, they have an inner urge to transfer and transmit all the knowledge that they have gained, to their readers. Falling for that temptation they tend to write a long essay on the subject and incorporate it in the introduction section. In fact, the authors should avoid including what an average reader would already know and then proceed to include that information related to the problem being addressed. They should remember that the background information should be focused and should not aim to provide all that is known on the broad subject. For example, while describing a study that attempted to determine the comparative efficacy and safety of two regimens in HIV infected children, information related to the prevalence, clinical manifestations and

complications of HIV-infection would not be quite relevant. The introduction, in this case, should begin with the known advantages and limitations of the currently used therapy.

Providing details of the previously conducted research:

While describing current state of knowledge, the authors will need to refer to previously conducted research.

This should be done by stating the conclusions drawn by these studies without going into the details such as the study sites, number of participants enrolled, follow-up rates etc. If some readers wish to confirm the statements made or to find out more about these studies, they can easily do so on the basis of reference details provide by the authors.

Packing the introduction with too many references:

Introduction is not the section to have an extensive literature review. Hence, only the absolutely required material should be cited. Other reference material can be used while discussing the study findings in discussion. Authors would do well to cite original research articles (rather than review articles) while providing information about current state of knowledge in introduction.

Providing extensive critique of the previous studies:

Authors may have decided to conduct the study because of the limitations or methodological flaws in the previously reported evidence. While, they may refer to this fact while providing rationale for conducting the study; they should avoid extensive criticism of the earlier studies in introduction. They can touch upon the better methodology employed in the study while discussing the strength of the study under discussion.

Describing conclusions of the study:

The authors should remember that 'Introduction' is not the same as 'Abstract' of the article. It should include information about what questions is being answered, but the actual answer needs to be provided through the sections titled, results and discussion. Providing answers in the introduction would be akin to a novelist describing the climax of a suspense thriller in the first few paragraphs of the novel. The readers, then would have no inclination to read the complete story, whether in the novel or in the manuscript.

Inconsistency among various sections:

Most authors check their manuscript for inconsistencies before submitting the manuscript to a journal. However, many a times, they amend certain portions of the manuscript in response to reviewers and editor's suggestions. At times, changes made in one section, requires alterations other sections, as well. For example if a reviewer requests for a change in the way research question is framed; it may require corresponding changes in the discussion. The authors should, therefore, diligently check if there are any inconsistencies or contradictory statements, every time any portion of the manuscript is revised.⁵

Overlapping information under introduction and discussion:

As both these sections refer to published literature on the subject, there is danger of duplication of statements. It must be kept in mind that introduction is a section wherein the authors use published studies to explain the current state of knowledge; while in discussion they describe the overall evidence available and compare it with the evidence generated by the study². Although, the articles referred to in the two sections could overlap to a certain extent; the perspective with which they would be referred to should differ. Repeating ideas, words and phrases makes the reader think that the author does not have much to discuss.⁵

Not reporting relevant information in the 'Introduction':

Sometimes, it is noticed that the authors do not cite an important study that has already answered the research question in the 'Introduction' section to bestow a status of originality to their study. However, a diligent reader spots that the findings from the earlier study are discussed subsequently in the manuscript. The

reader is likely to feel cheated when he understands that the present manuscript is merely reiterating previously reported results¹⁰.

To summarize the introduction section of the manuscript should be brief and yet informative. It should convince the reader about the need to conduct the study and the importance of research work done. It should make the reader inquisitive about how the mystery was unraveled and motivated him to read further.

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