Basic structure of a Research Paper for publication with the Nkumba International Research Journal

Abstract

Communicating research findings is an essential step in the research process. Often, peer-reviewed journals are the forum for such communication, yet many researchers are never taught how to write a publishable paper. In this document, we explain the basic structure of a research paper and describe the information that should be included in each section. This document also identifies common pitfalls for each section and recommends strategies to avoid them.

Introduction

Typically, a research paper consists of the following sections: the introduction, methods, results/findings, and discussion, sections. In the following discussion, you will see how Nkumba International Research Journal prefers each section to be formatted.

1. Structure of the Introduction Section

The introduction section should be approximately three to five paragraphs in length. This section should include the elements shown in Fig. 1. Begin with a general context, narrowing to the specific focus of the pa- per. Include five main elements: why your research is important, what is already known about the topic, the "gap" or what is not yet known about the topic, why it is important to learn the new information that your research adds, and the specific research aim(s) that your paper addresses. Your research aim should address the gap you identified. Be sure to add enough background information to enable readers to understand your study.

Fig. 1 The main elements of the introduction section of an original research article. Often, the elements overlap.



Table 1 provides common introduction section pitfalls and recommendations for addressing them.

Pitfall	Suggestion
Introduction is not written to the readers of the Nkumba International Research Journal	Nkumba International Research Journal is a generic-type Journal. It is for the general audience. Typically, you should include more background information to interest readers who may not necessarily be experts in your field. A narrower journal, e.g., one which may be for engineers, lawyers, etc., may require less background information because most of its readers have expertise in the subject matter.
Citations are inadequate to support claims	*Cite all statements that could be challenged.* If a claim could be debated, it should be supported by one or more citations.
The research aim is vague	*Include enough key information to allow readers to imagine the analysis.* Be sure that your research aim contains essential details like the setting, population/sample, study design, timing, dependent variable, and independent variables. Using such details, the reader should be able to imagine the analysis you have conducted.

2. Methods Section

The purpose of the methods section is twofold: to explain how the study was done in enough detail to enable its replication and to provide enough contextual detail to enable readers to understand and interpret the results. In general, the essential elements of a methods section are the following: a description of the setting and participants, the study design and timing, the recruitment of respondents or subjects and sampling, the data collection process, the dataset, the dependent and independent variables, the covariates (where applicable), the analytic approach for each research objective, and the ethical approval. The key concern of an exemplary methods section is the justification of why each method was used.

Table 2 provides common methods section pitfalls and recommendations for addressing them.

Pitfall	Suggestion
The author only describes methods for one study aim, or part of an aim	*Make sure the methods are complete.* Be sure to check that the methods describe all aspects of the study reported in the manuscript.
There is not enough (or any) justification for the methods used	Be sure to check that the methods describe all aspects of the study reported in the manuscript. *Justify each approach and variable.* You must justify your choice of methods because it greatly impacts the interpretation of results. State the methods you used and then defend those decisions. For example, justify why you chose to include the measurements, covariates, and statistical approaches.

3.Results Section

The focus of the results section should be associations, or lack thereof, rather than statistical tests. Two considerations should guide your writing here. First, the results should present answers to each part of the research aim. Second, return to the methods section to ensure that the analysis and variables for each result have been explained.

Begin the results section by describing the number of participants in the final sample and details such as the number who were approached to participate, the proportion who were eligible and who enrolled, and the number of participants who dropped out. The next part of the results should describe the participant characteristics. After that, you may organize your results by the aim or by putting the most exciting results first.

Do not forget to report your non-significant associations. These are still findings. Tables and figures capture the reader's attention and efficiently communicate your main findings. Each table and figure should have a clear message and should complement, rather than repeat, the text. Tables and figures should communicate all outstanding details necessary for a reader to understand the findings without consulting the text.

Include information on comparisons and tests, as well as information about the sample and timing of the study in the title, legend, or in a footnote.

Note that figures are often more visually interesting than tables, so if it is feasible to make a figure, make a figure. To avoid confusing the reader, either avoid abbreviations in tables and figures, or define them in a footnote. Note that there should not be citations in the results section and you should not interpret results here.

Table 3 provides common results section pitfalls and recommendations for addressing them.

Table 3 Common results section pitfalls and recommendations

Pitfall	Suggestion
The text focuses on statistical tests rather than associations.	*Focus on associations instead of statistical tests.* The relationships between independent and dependent variables are at the heart of scientific studies and statistical tests are a set of strategies used to elucidate such relationships. For example, instead of reporting that "the odds ratio is 3.4," report that "women with exposure X were 3.4 times more likely to have disease Y." There are several ways to express such associations, but all successful approaches focus on the relationships between the variables. Only some study designs and analytic approaches enable researchers to make causal claims. Before you use the word "cause," consider whether this is justified given your design. Words like "associated" or "related" may be more appropriate.
The direction of association unclear	*Be explicit about direction of association.* Instead of "X is associated with Y," say "an increase in variable X is associated with a decrease in variable Y," a sentence which more fully describes the relationship between the two variables

4. Discussion Section

Unlike the introduction section, the discussion should take the form of a right-side-up triangle beginning with interpretation of your results and moving to general implications (Fig. 2). This section typically begins with a restatement of the main findings, which can usually be accomplished with a few carefully-crafted sentences. Next, interpret the meaning or explain the significance of your results, lifting the reader's gaze from the study's specific findings to more general applications.

Then, compare these study findings with other research. Are these findings in agreement or disagreement with those from other studies? Does this study impart additional nuance to well-accepted theories? Situate your findings within the broader context of scientific literature, then explain the pathways or mechanisms that might give rise to, or explain, the results.

Journals vary in their approach to strengths and limitations sections: some are embedded paragraphs within the discussion section, while some mandate separate section headings. Keep in mind that every study has strengths and limitations. Candidly reporting yours helps readers to correctly interpret your research findings.

The next element of the discussion is a summary of the potential impacts and applications of the research. Should these results be used to optimally design an intervention? Does the work have implications for clinical protocols or public policy? These considerations will help the reader to further grasp the possible impacts of the presented work.

Finally, the discussion should conclude with specific suggestions for future work. Here, you have an opportunity to illuminate specific gaps in the literature that compel further study. Avoid the phrase "future research is necessary" because the recommendation is too general to be helpful to readers. Instead, provide substantive and specific recommendations for future studies.

Fig. 2 Major elements of the discussion section of an original research article. Often, the elements overlap

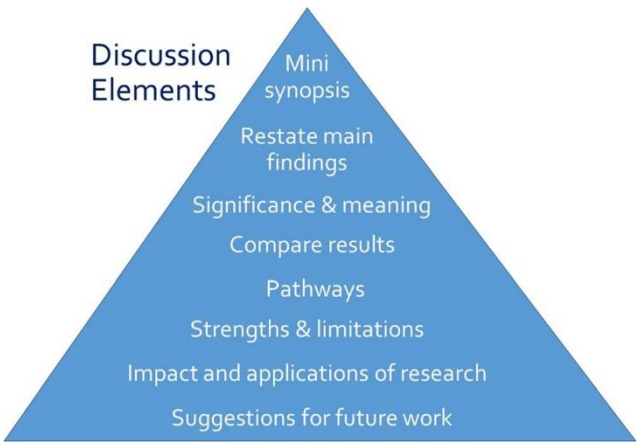


Table 3 Common discussion section pitfalls and recommendations

Pitfall	Suggestion
The author repeats detailed results or presents new results in the discussion section	*Focus on how your study fits into the scientific literature.* Recall from Fig. 1 that the discussion section should take the shape of a triangle as it moves from a specific restatement of the main findings to a broader discussion of the scientific literature and implications of the study. Specific values should not be repeated in the discussion. It is also not appropriate to include new results in the discussion section. It is also not appropriate to include new results in the discussion section.
The author fails to describe the implication of the study's limitations	*Where possible, identify the implications of your study's limitations.* No matter how well-conducted and thoughtful, all studies have limitations. Candidly describe how the limitations affect the application of the findings.
Statements about future research are too generic	*Be specific!* Is the relationship between exposure and outcome not well-described in a population that is severely impacted? Or might there be another variable that modifies the relationship between exposure and outcome? This is your opportunity to suggest areas requiring further study in your field, steering scientific inquiry toward the most meaningful questions