

CONSCIOUS WRITING

The Essential Elements of the Discussion Section of a Research Manuscript

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ABSTRACT

Many medical writers believe that the Discussion is the most difficult section of a research manuscript to write, largely because of its structural flexibility and open-ended nature. However, medical writers can build confidence in writing this section by ensuring that the Discussion includes the essential elements: a summary of the major findings, interpretations of the important findings, descriptions of the implications and applications of the findings, a discussion of the strengths and limitations of the study, details about recommended future directions, and statements of the significance and relevance of the work. These essential elements help to form an effective Discussion that showcases the study and highlights its impact to the field.

Many medical writers believe that the Discussion section of a research manuscript is the most difficult section to write. This difficulty is related to several factors. First, the Discussion describes the authors' interpretations of the findings, which requires careful thought and presentation. Also, the Discussion needs to explain these interpretations in the context of what is known in the field, which requires a thorough analysis of the literature and consideration of how the findings connect to that literature. Furthermore, the Discussion section does not follow a standard structure, which gives medical writers more creative freedom in writing this section. Although this creative freedom might be liberating for some medical writers, others may feel anxiety or even dread.

Although the Discussion is the hardest section to write, medical writers can find solace with recommendations on the essential elements to include in this section (Box). These recommendations are not prescriptive nor exhaustive, but they are a solid starting point for helping medical writers feel more confident and focused in crafting an effective Discussion.

ESSENTIAL ELEMENTS OF A DISCUSSION SECTION

Summarize the major findings

- Repeat the study question
- Synthesize the most important findings
- State how the findings answer the study question

Interpret the important findings

- Describe how important findings are interrelated
- Discuss unexpected and interesting findings
- Explain how important findings extend or support previous findings
- Explain how important findings contradict previous findings

Describe the implications and applications

- Describe the theoretical implications of the findings
- Describe the practical applications of the findings

Discuss the strengths and limitations

- Highlight the strengths of the study
- Acknowledge the limitations of the study

Recommend future directions

- Suggest next steps and future work

State the conclusions and impact

- Repeat the main outcome
- Describe the main contribution to the field
- Emphasize the relevance and significance to the field

SUMMARIZE THE MAJOR FINDINGS

The first paragraph of the Discussion is an opportunity to transition readers from a dense Results section into a discussion of the findings and interpretations. In this first paragraph, the main goal is to tie the important findings back to the study question.

Repeat the Study Question

To reorient readers to the overall purpose of the study and prepare them to navigate the Discussion, start with a statement that reminds them of the study question you posed at the end of the Introduction. This statement should include

the key aim(s) of the study, the main objective(s), and, when relevant, the hypothesis.

Synthesize the Most Important Findings

After restating the question, summarize the most important findings that answer the study question. In this summary, be careful not to rehash the findings. Instead, synthesize the findings in a way that supports the answer to the study question. If the manuscript is highlighting a new approach that was developed, describe the overall approach that was developed and validated.

State How the Findings Answer the Study Question

At the end of this first paragraph, state how the summarized findings answer the study question. This sentence helps to tie the key findings together in a nice package that showcases how they are connected to the question and how they advance the field.

INTERPRET THE IMPORTANT FINDINGS

The bulk of the Discussion includes the authors' interpretations of the important findings and how they fit into what is known in the field. These interpretations can vary widely among studies and fields—which contributes to the common perception of the Discussion being the most difficult part of a research manuscript to write. However, the following recommended features can help authors ensure they include the essential elements of an effective Discussion.

Describe How Important Findings Are Interrelated

In the Discussion, describe any relationships in the findings. Are there any correlations or incongruence between different findings? Are there any patterns in the data? Could any of the findings influence other findings? Be sure to explain how these relationships could affect the outcomes or implications of the study.

Discuss Unexpected and Interesting Findings

Although many researchers anticipate the outcomes of their work, they may still uncover surprising, intriguing, or inconclusive findings. In the Discussion, describe these interesting findings and any findings that do not support the answer to the study question. Importantly, share why these findings are particularly interesting and what new questions arise as a result. Some examples include rationalizing unexpected outcomes, clarifying inconclusive findings, and interpreting data outliers.

Explain How Important Findings Extend or Support Previous Findings

Most research builds on previous work. Although the

Introduction should describe this previous work to frame the rationale for the study, the Discussion section frames how this previous work connects to the findings in the study. To discuss these connections, describe how the findings build on what is already known. For example, how do the study findings support or extend findings from previous work?

Explain How Important Findings Contradict Previous Findings

In addition to connecting the findings to previous work, the Discussion should also examine any disconnections from previous work. For example, how do the study findings contradict or refute previous findings? When highlighting these disconnections, speculate on why the findings might be contradictory. For example, was the approach different? Was the population or sample size different? Was the analysis different? Answering these questions is an opportunity to defend the work in this study and strengthen the significance of the findings.

DESCRIBE THE IMPLICATIONS AND APPLICATIONS

To ensure that readers fully appreciate the significance of the study, the Discussion needs to include a description of the potential implications and applications of the findings. In other words, how do the findings advance the field, and what can be done now that these findings have been revealed? This description will depend on the study and generally include theoretical implications and/or practical applications.

Describe the Theoretical Implications of the Findings

In the Discussion section, be sure to describe the theoretical implications of the findings. Theoretical implications are evidence-based speculations on how the findings impact research in the field. As the name implies, these implications describe how the findings advance the field but cannot yet be meaningfully applied in the real world.

Describe the Practical Applications of the Findings

In the Discussion section, describe any practical applications of the findings. Practical applications are evidence-based recommendations or solutions that can be used in the real world. These applications are often calls to action, such as new approaches to research, changes to clinical practice, or updates to government policies.

DISCUSS THE STRENGTHS AND LIMITATIONS

The Discussion section needs to highlight the strengths and limitations of the study. These details help readers to understand how definitive (ie, significant) the findings are.

Highlight the Strengths of the Study

Few journals specifically request that authors highlight the strengths of a study. And some authors feel uncomfortable or immodest about highlighting these strengths. But describing the strengths can help readers understand the value of the findings and significance of the study. When highlighting the strengths, consider all aspects of the study, including the conceptual framework, population, experimental techniques, and statistical analysis.

Acknowledge the Limitations of the Study

An important part of the Discussion is acknowledging the limitations of the study. Be sure to describe these limitations and, importantly, how they could have affected the outcomes, interpretations, and conclusions. For example, what problems occurred? What are the weaknesses or assumptions made in the methods? What gaps does the data leave open? Acknowledging these limitations gives the opportunity to share the rationale for doing the work despite the limitations or to suggest future directions of the work.

RECOMMEND FUTURE DIRECTIONS

The Discussion section should include recommendations for future work. These details describe what next steps could be done to build on or fill any gaps in the work and to further advance the field.

Suggest Next Steps and Future Work

In the Discussion, describe what could be done next by the research team or others in the field. For example, if the study needed to be repeated, what could be done differently? If the study created gaps in knowledge, what could be done to fill them? If unlimited resources were available, what could be done next?

STATE THE CONCLUSIONS AND IMPACT

At the end of the Discussion, readers have the full context of the study and how it fits into the existing literature. The conclusions paragraph is then final opportunity to highlight the significance of the work and leave readers with a lasting positive impression of the study.

Repeat the Main Outcome

Start by repeating the main outcome of the study, but do not summarize the findings again. Repeating the main outcome reminds readers of the most important result(s) of the study.

Describe the Main Contribution to the Field

Next, state how the main outcome answers the study question. This answer will show readers that the study accomplished its purpose of answering the question and filling a gap or need in the field.

Emphasize the Relevance and Significance to the Field

Finally, share how the study advances the field. Ending with this information highlights the relevance and significance of the work at the end of the manuscript, the prime position for leaving a lasting impact on readers.

THE ESSENTIAL ELEMENTS SHOWCASE THE STUDY

An effective Discussion showcases the findings and significance of the study in the context of what is already known. For a medical writer, this task can be difficult and overwhelming—especially with the structural flexibility and open-ended nature of the Discussion section. But with these essential elements at their fingertips, medical writers can sharpen their focus and build their confidence in crafting an effective Discussion.

Author declaration and disclosures: *The author does not have any commercial associations that may pose a conflict of interest related this article.*

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