

HOW TO

How to ... write an abstract

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Abstract writing, a necessary academic skill for all researchers, is an art in succinct and compelling scientific storytelling. The concise nature of an abstract emphasises these challenges: How can we apply principles for effective written communication in a concentrated and compact form without losing comprehension? The guidelines below will support abstract writing for submission acceptance, use and citation.¹⁻³

Lingard and Watling's⁴ 'It's a *story*, not a *study*' provides a paradigmatic shift in thinking about academic writing. While a study lives in the methods and results of a report, a story unfolds in the introduction, discussion and conclusion.⁵ A study may be primarily concerned with the accuracy of the reporting, but a story seeks to be *persuasive*—understandable, compelling and memorable.⁵ To be persuasive, writers should focus on the *how* (organisation or structure of writing) and *why* (relevance and impact of writing, i.e., introduction, discussion and conclusion) questions, over the *what* (i.e., methods).⁶ However, foundational to a persuasive story is academic rigour; without quality, a story cannot be compelling.

Varpio et al.³ outline how to develop a persuasive argument through use of 'ethos' (appeal to credibility), 'pathos' (appeal to emotion) and 'logos' (appeal to logic) (Table 1). The 'problem, gap, hook' heuristic is another helpful guide in capturing the essential elements of an successful abstract (Table 1).^{4,5}

PRINCIPLES FOR EFFECTIVE ABSTRACT WRITING

Know your audience

If writing a paper is likened to entering a conversation,⁵ then writing an abstract is akin to a 2-minute elevator pitch. Before you begin, you

need to know *who* you are talking to: Who is your audience?⁷ Speaking to a particular audience, and appealing to their interests and emotions, addresses 'pathos'.³

Align the structures of your abstract and submission

Abstract writing begins at the end of the manuscript writing process, along with finalising the title and key words.² Abstract structures vary, according to journal or conference requirements. However, overall, your abstract must tell a logical story. An initial generic structure of introduction/purpose, methods, results and discussion and/or conclusion can provide a clear starting point.³ Others suggest using more specific and informative headings such as background, objectives, design, setting, participants, interventions and outcomes, for greater impact and readability.^{2,8} Practically, you can also copy and paste existing content directly from your manuscript into your abstract to be edited down.²

Whatever approach you use, aim for structural cohesiveness: alignment between the structures of your abstract and submission (i.e., 'logos'),^{2,8} and adhere to the journal or conference guidelines.^{2,9,10} If you think of your abstract as a map to guide the reader on their journey through your research, then a mismatched abstract could lead to them becoming lost or the final destination not being reached.

Arouse interest in your introduction to promote further reading

The opening sentence of your abstract is critical, for it is the first (and potentially last) thing a reader reads. An abstract is a promotional

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TABLE 1 Tips for each stage and section of abstract writing.

Abstract stage or section	Reflective question:	Practical considerations
Before	Who is your audience? <ul style="list-style-type: none"> Journal editors, reviewers, readership Conference peer reviewers, selection committee, attendees Inter/national readers Non/health professionals In/experienced researchers 	<ul style="list-style-type: none"> Involve all authors. Consider varied assumptions and levels of literacy of different audiences regarding your research phenomenon. Remember accessibility, diversity and inclusivity (e.g., language usage for non-native English speakers). Conform abstract to journal or conference guidelines (e.g., structure, journal aims/scope, conference themes, in-/exclusion of references).
Abstract introduction	What is your research problem and why does it matter to the reader? What research gap does your study seek to close?	<ul style="list-style-type: none"> Use a strong opening statement to grab the reader's attention. Clearly state your research problem and relate it to your audience (i.e., relevance, significance, timeliness; 'pathos' and 'hook'). Establish rigour through inclusion of key theorists, best available evidence, seminal or the latest papers (i.e., 'ethos').
Abstract methodology	What is your research design to answer your research question/s?	<ul style="list-style-type: none"> Align your research problem and methodology (i.e., appropriateness; 'ethos'). Provide sufficient detail.
Abstract results	What are your most significant findings that answer your research question/s?	<ul style="list-style-type: none"> Include specific details in order to convert initial interest into committed manuscript readers (for use and citation) or conference activity attendees.
Abstract discussion and conclusion	Why does this research matter? What are the implications of your study and actionable insights for the reader?	<ul style="list-style-type: none"> Address implications of the results, aligning to the introduction, for a unified story with a logical ending (i.e., 'logos'). Include future research (i.e., 'logos').
After	What words are you using? Is this story concise but compelling?	<ul style="list-style-type: none"> Consider word choice and edit. Check for narrative flow, clarity and consistency/logic (i.e., 'logos'). Use linking or transition words to connect each section. Do not include unspecified abbreviations or complex terminology, unless you are able to define them. Read your abstract aloud to evaluate word choice and sentence structures. Ensure all authors, and independent critical readers if possible, review the abstract before submission.

document, for it seeks to 'sell' your research to a reader and persuade them to engage further.³ A strong opening statement, headlining the significance and timeliness (i.e., 'hook') of your research problem, in consideration of its relevance to key stakeholders, should grab a reader's interest.^{1,2,9,11}

Beyond sparking interest, stating the topic and purpose of the research early on establishes a cognitive starting point for the reader to follow throughout the rest of the abstract as the narrative is unpacked.¹² Put differently, if the 'hook' is a seed of promise planted in the introduction, the reader will reap its full rewards, in terms of study implications, in the discussion/conclusion.⁴ This also speaks to delivering on readers expectations (i.e., 'pathos').^{3,9,12}

If word count allows, inclusion of literature reviewed, best available evidence or theories/concepts drawn upon supports the 'ethos' or credibility of your research.^{7,10,13} In general, references are not included in abstracts, yet referencing a seminal (or recent ground-breaking) paper or naming a key theorist/researcher in the field, can lend rigour (i.e., 'ethos') to your submission.^{1,3}

Briefly include methodology and elements of rigour

Inclusions of methodological details (i.e., paradigms and research design, such as case study, grounded theory, ethnography, action research, narrative inquiry, phenomenology and mixed methods, including data collection methods and analytic strategies) can demonstrate the rigour (i.e., 'logos') of your research.^{1,10} Include informative elements, such as sampling or participants, context, interventions, ethics and reflexivity, if words allow,⁸⁻¹⁰ keeping reliability and transferability to the audience in mind.

Detail your results

The results, analysis, discussion and conclusion sections should form the bulk of your abstract.^{2,10} Do not hide your findings! Compel the reader to continue reading your paper through including the *details* of your results, whether precise numeric data or complete qualitative

themes.^{2,9,10,14} Providing incomplete or insufficient information in an abstract could lead to the rejection of your submission.¹

Include take home messages in your discussion and conclusion

The discussion and conclusion are the ‘climax’ of your story.¹⁵ Do not restate your results; rather, connect back to the study significance in the introduction. This final section must state *why* this research matters, while highlighting the novelty and implications of the work.^{2,4,15}

Be explicit in reporting actionable conclusions: Do not make the readers guess at the meaning or impact of your findings.² For instance, ‘take home messages’ are often translations of findings into practice for the reader to implement.³ The relevance, currency or transferability, of the work to other settings should also be addressed.^{7,10,13}

However, writers need to be mindful that scientific rigour needs to be maintained. Conclusions should be realistic and justifiable, without under- or over-interpreting the findings and implications of your work.^{1,2,7,9,10,16} Finally, what is the inevitable next chapter (future research) of this story should be shared.^{5,9,13}

Edit ruthlessly

The compressed nature of an abstract means that every single word choice should be carefully considered.³ Do not waste words on platitudes or filler sentences; ruthlessly edit unnecessary adjectives and adverbs.⁴ Use transitional words or phrases to show connections.³ Cook¹¹ recommends reading your writing out loud in order to identify awkward sentences or inconsistencies. Involve all authors in the writing and reviewing of your abstract, as well as independent critical readers who may offer a fresh set of eyes on the ‘final’ product.^{9,11} Lastly, proofread and polish your writing before submission, taking care to correct poor grammar or typographical errors.^{9,11}

IN CLOSING

Abstracts should tell stories. These stories need to be accessible to the reader: The narrative should be easy to follow, the structure logical and cohesive and the content understandable (i.e., ‘logos’).^{1-3,10,16} The story must appeal to the reader, grabbing their interest through relevance and relatability (i.e., ‘pathos’). While the packaging of a story is crucial, no amount of good writing can make up for shoddy science or poor quality research, such as ignoring the literature, poorly design studies, inappropriate methods, insufficient data collection and a lack of relevance, rigour, originality or innovation (i.e., ‘ethos’).^{1,3,6,10,13} Lastly, practice makes perfect. It is only through writing, and *re-writing*, that we can improve in our craft.

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Danica Anne Sims: Conceptualization; writing—original draft; writing—review and editing; investigation; visualization; formal analysis; project administration; resources.

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The authors have no conflict of interest to disclose.

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Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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The authors have no ethical statement to declare.

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