Publishing with Purpose: Guidance for Research Paper Writing

Introduction:

A peer-reviewed scientific publication is often the first (foundational) output of a research study. This document serves as a comprehensive guide for writing scientific papers, building on previously developed documents on research question development, study protocols, and hypothesis testing. It is structured to support researchers in preparing manuscripts that align with WHRI's standards and international scientific reporting norms.

Relevant documents

WHRI Standard Operating Procedure (SOP): Research Question Development

WHRI guidelines for research question development
WHRI Standard Operating Procedures (SOP): Study protocol development
WHRI guidelines for Study protocol development
WHRI Standard Operating Procedures (SOP): Hypothesis testing
WHRI guidelines for Hypothesis testing

Planning the Manuscript:

Writing your manuscript should feel like assembling the final pieces of a well-planned puzzle, after having reviewed our guidelines covering research question development, protocol design, SMART objectives, and hypothesis testing—Each prior step has been designed to build a logical structure and ensure methodological clarity, making the paper-writing stage more about integration than invention. At this point, you are not starting from scratch—you are translating a body of carefully structured work into a compelling scientific narrative.

Writing the paper becomes a process of synthesis: drawing together your research question, background rationale, study design, methodology, and results into a cohesive and readable manuscript. Because your data collection and analysis have been guided by clear objectives and robust protocols, the emphasis now shifts to clarity, flow, and communication. The hard analytical work is done—this is your opportunity to share insights, demonstrate impact, and contribute to the scientific community with confidence and precision.

Identify a journal

Identifying several potential journals early in the writing process is essential for effective research dissemination. Journals vary in scope, audience, impact, and submission requirements, and aligning your manuscript with the right journal increases the likelihood of acceptance and meaningful impact.

Having a shortlist of journals provides strategic flexibility. If the first-choice journal declines the submission, alternative options can be pursued promptly without major delays. Journals should be assessed for their relevance to the topic, target audience, open access policies, and typical time to publication.

Selecting the right journal ensures your work reaches the intended audience—whether researchers, clinicians, policymakers, or broader communities. For example, a methodological study may suit a specialty journal, while policy-focused findings may be better placed in a public health outlet. Reviewing recent articles can help assess fit.

Considering multiple journals also encourages a more intentional approach to research communication. It prompts reflection on how findings serve diverse knowledge users and provides opportunities to align with evolving publication standards, such as equity in reporting or open science practices.

Title and Abstract

Your title and abstract are the first impression of your work—they must be concise, clear, and informative. The title should reflect your study's key objective or finding, using language that is specific but accessible to a broad audience. Abstracts should follow a structured format—Background, Objectives, Methods, Results, and Conclusion. If your target journal allows only a narrative abstract, these same elements should still be clearly present. When drafting your abstract, draw from your SMART objectives, statistical analysis plan, and main results. Be sure to include the most relevant effect estimates and statistical outcomes that directly support your conclusion.

! My tip: *Write the abstract after the paper is written and first draft is reviewed by all the co-authors.*

Paper Introduction

The introduction sets the stage for your study by building a logical narrative that leads the reader to your research question. Begin by outlining the broader context and summarizing what is already known about

your topic. This background should directly reflect the literature mapping and theoretical framing you conducted during the research question development phase. Highlight the specific gap in knowledge, policy, or clinical practice that your study addresses—this should align with the gaps identified through your structured literature review and conceptual framework exploration.

This section is not just an opening—it is the bridge between prior research and your current study. Reuse the language and logic from your research question development document to articulate why your question matters, who it applies to, and what it aims to resolve. Conclude the introduction with a clear, concise research aim or hypothesis. This final sentence should reflect the SMART objective outlined in your study protocol and provide a natural transition into the Methods section.

It's important to recognize that not all study objectives can or should be addressed in a single paper. Attempting to summarize every aim or dataset in one manuscript can overwhelm the reader and dilute your message. Instead, consider focusing each manuscript on a clearly defined objective or theme. This not only improves clarity but also allows for deeper analysis and better alignment with targeted journals. Let your introduction reflect this focus by narrowing in on one core objective per paper—even if your broader study supports multiple future publications.

Methods:

The methods section should provide sufficient detail to allow another researcher to replicate your study accurately. It should describe how the study was designed, conducted, analyzed, and ethically reviewed. This section is typically structured using sub-sections to improve clarity and flow, particularly in studies with multiple components:

In the Study Setting and Time Frame, describe where and when the study was conducted. Include information such as the institution(s), city/province, and whether it was a single- or multi-site study. Clearly define the study period, including key phases such as recruitment start and end dates, duration of data collection, and follow-up periods. For longitudinal studies, include time points for repeated measurements.

Under Study Population, provide detailed inclusion and exclusion criteria, how participants were identified, and the recruitment process (e.g., clinical referral, community outreach, database screening). Indicate how many participants were approached, enrolled, and included in the final analysis, and justify your sample size based on prior calculations or power analyses as specified in your protocol.

! My tip: *If you decided to exclude participants based on a specific criteria, I would recommend an included vs excluded demographic comparison to ensure later adjustment in the model.*

If the study involves an Intervention, describe its components thoroughly: type (e.g., pharmacologic, behavioral), frequency, duration, delivery method, and who administered it. For comparator groups, explain what they received (e.g., usual care, placebo).

In the Outcomes and Measures section, define the primary and secondary outcomes, including how and when they were measured. Use validated instruments where possible and cite their sources. Include timing of outcome assessments (e.g., baseline, 6-week follow-up) and specify who collected the data (e.g., blinded assessors, automated tools).

! My tip: *When planning your statistical analysis, include a summary of the relevant literature—with appropriate references—to justify why specific variables are included in your model as covariates or confounders. This strengthens the rationale for your model structure and can pre-empt common reviewer concerns about selectively choosing variables for adjustment. Of course, we may not have access to all possible confounders in every dataset, but it's important to justify the use of those we do have based on existing evidence and theoretical relevance. Clear justification builds credibility and demonstrates thoughtful model development.*

The Data Collection and Management sub-section should briefly describe how data were captured (e.g., REDCap, paper forms), stored, and quality controlled. Mention any procedures for data validation, double-entry, or interim checks.

! Note: it is important to cite REDCap. When citing REDCap in publications, please use the following:

Prospective participants were provided a brief summary of the study objectives, and sent a link or QR code to the consent form and online survey, collected and managed using REDCap electronic data capture tools hosted at The BC Children's Hospital Research Institute.1,2 REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources. (captured with BC Children's Hospital Research Institute REDCap).

1PA Harris, R Taylor, R Thielke, J Payne, N Gonzalez, JG. Conde, Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support, J Biomed Inform. 2009 Apr;42(2):377-81.

2PA Harris, R Taylor, BL Minor, V Elliott, M Fernandez, L O'Neal, L McLeod, G Delacqua, F Delacqua, J Kirby, SN Duda, REDCap Consortium, The REDCap consortium: Building an international community of software partners, J Biomed Inform. 2019 May 9 [doi: 10.1016/j.jbi.2019.103208]

The Statistical Analysis section should outline the methods used to analyze your data, aligned with the Statistical Analysis Plan (SAP). Specify the types of statistical tests or models applied (e.g., logistic regression, Cox proportional hazards), handling of missing data (e.g., complete case analysis, multiple imputation), inclusion of covariates, and software used (e.g., SAS 9.4, R 4.3). Include your significance level (e.g., $\alpha = 0.05$) and whether confidence intervals were calculated. If applicable, describe any sensitivity analyses or subgroup analyses conducted.

Finally, under Ethical Considerations, indicate that the study received ethics approval, including the name of the approving Research Ethics Board (REB), the approval number, and how informed consent was obtained. If vulnerable populations were involved, describe any additional protections implemented.

To ensure consistency with most journal requirements organize the Methods section into sub-headings such as:

- Study Design
- Study Setting and Time Frame
- Participants and Recruitment
- Intervention (if applicable)
- Outcomes and Measures
- Data Collection and Management
- Statistical Analysis
- Ethical Considerations

Not all sub-sections listed below will be relevant to every paper. The methods section should be tailored to reflect the specific study being reported. For example, if your manuscript does not involve an intervention, the Intervention sub-section may be omitted. Similarly, in secondary data analyses or brief methodological reports, certain elements such as Data Collection and Management may be summarized more concisely or integrated into other sections. The key is to include only the components necessary to transparently and accurately describe how your study was conducted and analyzed. Clear, focused reporting is always preferable to including unnecessary detail. However, using this structured format enhances transparency, facilitates peer review, and improves the overall readability and reproducibility of your manuscript.

Results:

Your results section presents the data, not the interpretation—that comes later. Start with a description of your study population using descriptive statistics (e.g., age, gender, baseline characteristics). Then report findings for your primary outcome, followed by secondary outcomes. Use tables and figures to support the narrative and avoid duplicating data in both formats. Clearly state effect sizes, p-values, and confidence intervals, as outlined in your statistical analysis plan. If you performed sensitivity analyses, describe them briefly and note whether the results changed materially. Keep the language objective and avoid drawing conclusions—this belongs in the discussion section.

The results section should present a clear and objective summary of your findings, aligned with the study objectives and analysis plan. At a minimum, the following components should be included:

- Descriptive Statistics (Table 1): Provide a table summarizing the characteristics of your study population. This is often referred to as Table 1. It may present the full sample or stratified by relevant groups (e.g., intervention vs. control, outcome categories). Include variables such as age, sex, sociodemographic characteristics, clinical indicators, and other key covariates. Indicate means and standard deviations for continuous variables, and frequencies and percentages for categorical variables.
- Primary and Secondary Outcomes: Clearly present the results for each outcome specified in your protocol. For studies involving comparisons, include appropriate statistical tests and p-values.

  ! My tip: *I often include a brief descriptive analysis of the outcome variable—either overall or stratified by comparison groups—before diving into statistical testing. Presenting a clear*

summary of the outcome distribution (e.g., mean scores, frequency categories, patterns across groups) provides important context and can enhance the reader's understanding before introducing more complex models. Thoughtfully describing your outcome up front adds value and supports a more cohesive flow in your results section.

- Modeling Results (e.g., Table 2): Report the results from any regression or statistical models used. Include estimates (e.g., odds ratios, hazard ratios, beta coefficients), confidence intervals, and p-values. Clearly label the reference groups and specify whether the results are adjusted or unadjusted.

  ! My tip: *When presenting your modeling results, it is recommended to include the fully adjusted model in the main manuscript. If you performed variable reduction (e.g., stepwise or backward selection), be sure to clearly describe the process and rationale in the methods section. Present reduced model results only if they enhance clarity or interpretability. Including both full and reduced models in the main text can often clutter the narrative. Decide which model best supports the storyline of your paper and consider placing other models and any sensitivity analyses—such as alternative model specifications or subgroup analyses—in the supplementary materials section. This approach allows you to demonstrate the robustness and stability of your findings without overwhelming the main results. It also helps reviewers and readers assess the consistency of your conclusions across different analytical approaches.*

- Figures and Additional Tables: Use visualizations to summarize trends, differences, or model predictions where appropriate. Forest plots, Kaplan-Meier curves, or stratified bar charts can complement the tables. Include footnotes and define all abbreviations.

Important Considerations for Structuring Results:

Before finalizing your results section, carefully review the author guidelines of your target journal. Many journals place specific limits on the number of tables, figures, and supplementary files that can be included. Ensure that your core findings are prioritized in the main manuscript and that all tables and visuals are essential for supporting the paper's objectives. Supplementary materials should be used strategically—not as a catch-all for extra content. Include only what adds meaningful value to the interpretation of your results, such as sensitivity analyses, extended modeling outputs, or

additional stratified tables. Overloading the supplementary section can make it difficult for reviewers and readers to navigate and detract from the overall clarity and impact of your work.

In conclusion, remember that a well-structured results section is essential for presenting your study findings with clarity, precision, and transparency. By thoughtfully organizing your data using tables, figures, and focused narrative summaries, you allow readers to follow your analytical path without distraction. Prioritize what is most relevant to your objectives, and let your results speak for themselves—saving interpretation for the discussion that follows.

Discussion:

The discussion interprets your findings in the context of the broader literature. Begin with a summary of the key results—what you found and why it matters. Then compare your results to previous studies, noting where your findings align or differ. This is where your earlier literature review becomes especially valuable. Discuss the strengths of your study, including aspects of your design, sample, or analytic approach. Next, address limitations—these might include bias, generalizability, missing data, or other methodological constraints. End the discussion by highlighting the implications of your work for practice, policy, or future research. Avoid restating your results verbatim—instead, focus on what they mean and why they matter.

! My tip: *Think of the discussion section as the narrative arc of your paper—it should tell a story, not just summarize results or list comparisons with previous studies. Aim to build a logical and reflective discussion that explains why your findings matter, how they relate to existing knowledge, and what their implications are for practice, policy, or future research. A strong discussion creates momentum and insight that naturally leads the reader to your conclusion. Let your interpretation flow, weaving evidence and reasoning into a coherent message rather than a bullet-point recap.*

Conclusion:

Your conclusion should be brief, focused, and aligned with your objectives. Summarize the main takeaway of the study in one or two sentences. Emphasize the significance of the findings and, if appropriate, include a forward-looking statement about next steps or future directions. Avoid repeating the entire discussion; this section should distill your findings to their essential message. This section is more than a closing statement—it is the final step that brings together everything you have carefully built throughout your project: the research question, protocol, study design,

objectives, and analysis. A strong conclusion reinforces how your work answers the original question and delivers on the purpose laid out from the very beginning.

References:

Your reference list should include only the most relevant and directly cited sources. Use the reference style required by your target journal (e.g., Vancouver, APA, AMA). Be consistent and ensure that all in-text citations appear in the list. Pull references directly from the literature review, methodology citations, and any scales or tools used in the analysis.

Acknowledgments, Funding, and Disclosures:

This section should recognize contributors who did not meet authorship criteria, such as research assistants or advisors. Acknowledge funding sources, including grant numbers if applicable, and state whether the funders had any role in study design or manuscript preparation. Disclose any conflicts of interest, even if none exist.

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Supplementary Material:

Supplementary materials play a key role in enhancing the transparency, reproducibility, and completeness of scientific reporting. In addition to including extended tables, figures, or sensitivity analyses, many journals and peer reviewers now expect authors to submit completed reporting checklists that align with the study design. These checklists help ensure that essential elements are included in the manuscript and that the study meets international reporting standards.

Below are the most used reporting checklists, which can be included as supplementary files during manuscript submission:

CONSORT (Consolidated Standards of Reporting Trials)

- Purpose: For reporting randomized controlled trials (RCTs)
- Includes: 25-item checklist and a participant flow diagram

- Covers: Trial design, randomization, blinding, sample size, outcome reporting, harms, and interpretation
- Why include it: Improves transparency and helps reviewers assess internal validity and risk of bias
- Official site and checklist: www.consort-statement.org
- Additional resources: CONSORT 2010 Statement: Updated Guidelines for Reporting Parallel Group Randomized Trials | Annals of Internal Medicine

STROBE (Strengthening the Reporting of Observational Studies in Epidemiology)

- Purpose: For observational studies, including cohort, case-control, and cross-sectional designs
- Includes: 22-item checklist tailored to each study type
- Covers: Study setting, participants, data sources, bias, variables, statistical methods, and generalizability
- Why include it: Ensures all key methodological details are reported clearly
- Official site and checklist: www.strobe-statement.org
- Additional resources
  https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.0040296
  Strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies | The BMJ
- There are specific checks list for different types of studies:

TRIPOD (Transparent Reporting of a multivariable prediction model for Individual Prognosis Or Diagnosis)

- Purpose: For studies that develop, validate, or update a prediction model (e.g., risk scores, prognostic tools)
- Includes: 22-item checklist
- Covers: Model objectives, data source, sample size, handling of predictors, missing data, model-building strategies, performance measures (e.g., calibration, discrimination), and validation

- Why include it: Promotes transparency in statistical modeling and is increasingly required for prediction studies
- Official site and checklist: www.tripod-statement.org

The **EQUATOR** Network (Enhancing the QUAlity and Transparency Of health Research)

A comprehensive database of over 500 reporting guidelines for health research

Searchable by study type (RCT, cohort, prediction, qualitative, etc.)

Ideal for checking whether there's a specific guideline for your study design

https://www.equator-network.org/

Additional Useful Sources:

NIH Reporting Guidelines directory:

https://www.nlm.nih.gov/services/research_report_guide.html

JAMA Instructions for Authors (Reporting Requirements section):

https://jamanetwork.com/journals/jama/pages/instructions-for-authors

! My **Tip:** *Even if a checklist is not required at the time of submission, using one during manuscript preparation improves clarity, supports peer review, and increases the likelihood of acceptance. It also good to include the checklist to be used in the grant application.*

Additional resources to look at while working on your paper

Guides to Writing and Research - Centre for Writing and Scholarly Communication