Outline for Manuscript Writing

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Introduction

- Outline
    - What is the health problem or outcome of interest and why is it important?
    - What is the exposure of interest and why might it be relevant for the outcome?
        - Note: sometimes, you may start with the exposure and why it is important and then discuss the specific outcome second.
    - What is known about the relationship between the exposure and outcome?
    - What is NOT known about the relationship between the exposure and outcome? What are the major gaps in this knowledge that your study will fill?
    - Why do these gaps prevent us from making progress towards improving the outcome of interest?
    - What are the main objectives/research questions of your study? What are your hypotheses?
- What *not* to include
    - Every statistic about your outcome that you can find.
    - A list of all known risk factors for your outcome
    - Information about tangentially related topics. For example, if your topic is depression, you do not need to tell us that depression is related to suicide if suicide is not a part of your study
    - Gaps in the literature that you are not going to fill (these may go in the Discussion section)

Methods

NOTE: Write this section in active voice – be sure that the sentence states ***who*** did the action, instead of implying that the action "was done" by no one.

Yes: "***We used*** linear regression models."
No: "Linear regression models ***were used***."

- Data and study population
    - Describe the data source or data set in terms of name, why it was collected in the first place (if you are doing secondary analyses), the source population, the study period, inclusion and exclusion criteria, and the sample size
    - Identify the analytic sample (i.e., the data you are analyzing) by stating whether and how you excluded observations, missing data, and the final analytic sample. This section should reference (and parallel) your analytic sample flow chart
    - Statement of IRB approval
- Measures

    - Clearly state exposure/independent and outcome/dependent variable
    - For each set of variables, clearly state:
        - The construct you are trying to measure (e.g., depression)
        - How this variable was measured during data collection (e.g., if you used a standard measure such as the CES-D to assess depressive symptoms)
        - How you are operationalizing the variable for analysis
            - Any linear transformation (natural log, etc.) or categorization that you did to the original variable
            - If the variable is categorical, state which category will serve as your reference group
    - List covariates:
        - For covariates, it is useful to state why you chose those variables in particular (e.g., based on previous literature suggesting that they confound the association between X and Y, include citation)
- Statistical analyses
    - Methods used to characterize the analytic sample (e.g., age, gender, socio-demographics), which may also involve identifying factors associated with sample attrition. (Univariate methods)
    - Methods used to evaluate the <u>unadjusted associations</u> between the primary variables of interest (e.g., exposure & outcome). Describe the specific statistical approach that was employed. (Bivariate analysis)
    - Methods used to evaluate the <u>adjusted associations</u> between the primary variables of interest. Describe the criteria used to define inclusion of covariates in these multivariate models.
    - Sensitivity analyses or analyses on subsets of participants to better understand any observed findings
    - State the statistical software used, note if you used survey weights

- <u>**Your methods should clearly tell the reader how you are going to answer the research questions or test the hypotheses that you proposed at the end of your introduction section.</u> For each analysis or model that you describe, think to yourself: "how does this answer my research question?" You may even want to state, "To test the hypothesis that XX, we did XXX."

<u>Results</u>

- The Results section should <u>parallel</u> the Methods section. If you described an analysis in the Methods section, then the results of that analysis need to be in the Results section (and vice versa)
- Descriptive/univariate
    - Describe your study sample. Do not list every variable in Table 1, but instead chose the variables that you think are either of interest (exposure, outcome, covariates) or that are unique to your sample (e.g., if your sample has a high proportion of individuals below poverty)
    - Should be a short paragraph
- Bivariate

    - Highlight associations of interest, such as the main exposure/outcome association and the association between any key covariates and the outcome
    - May be only one sentence
- Multivariate
    - Usually the main portion of your paper; one or more paragraphs
    - Highlight the findings that correspond directly to your research questions/hypotheses
- Sensitivity analyses
    - Highlight any places where your sensitivity analyses would lead you to a different conclusion than your main analyses
    - Otherwise, it is fine to say that these results "did not differ substantially" or "did not differ in magnitude, direction, or significance" from the main analyses.

- *Evaluation and interpretation* of specific results/findings will follow in the Discussion. In the Results section, simply report the findings that were observed.
- <u>By the end of your results section, the reader should be able to tell you the answer to your research question and/or whether or not you rejected your null hypothesis.</u> HOWEVER, you have to help the reader by highlighting the results that allow them to know this information. Your job is to pull out the important results, not just describe exactly what is in the tables or figures. However, you should not interpret your findings in the Results section.

<u>Discussion</u>

- The first paragraph should summarize your findings with respect to your research question/hypotheses. That is, do not summarize findings that are not related to your main research question.
- The next 1-3 paragraphs should do the following (order depends on logical flow and/or journal requirements)
    - Summarize additional/secondary findings if they are of interest
    - Provide additional context for your findings (e.g., discuss biological plausibility or relate back to a larger theory)
    - Compare your findings to prior literature (you must do this in the discussion, but sometimes it comes immediately after the summary and sometimes later)
- Limitations
    - For each limitation, you should
        - State the limitation
        - Discuss how you think the limitation might affect your findings. **This is very important. Do not just say that a variable may have measurement error – discuss whether you think that measurement error might be differential or non-differential and how that might bias or not bias your finding (and in what direction – towards or away from the null)
        - Ideally, state why you think this limitation is not such a big problem that it negates your study! (For example, cite a study showing that measurement error in this variable is small.)
- Summary of strengths
- Conclusion statement

- Be conservative; interpret your findings in a broader context but do not make grandiose or sweeping statements. Avoid making policy or clinical recommendations unless requested by the journal. Do not end with a sentence about future research.

Acknowledgements

- You may thank anyone who helped with the data collection, analysis, or writing that is not a co-author.
- Acknowledge sources of funding
- Check journal requirements for whether and how acknowledgements should be included

References

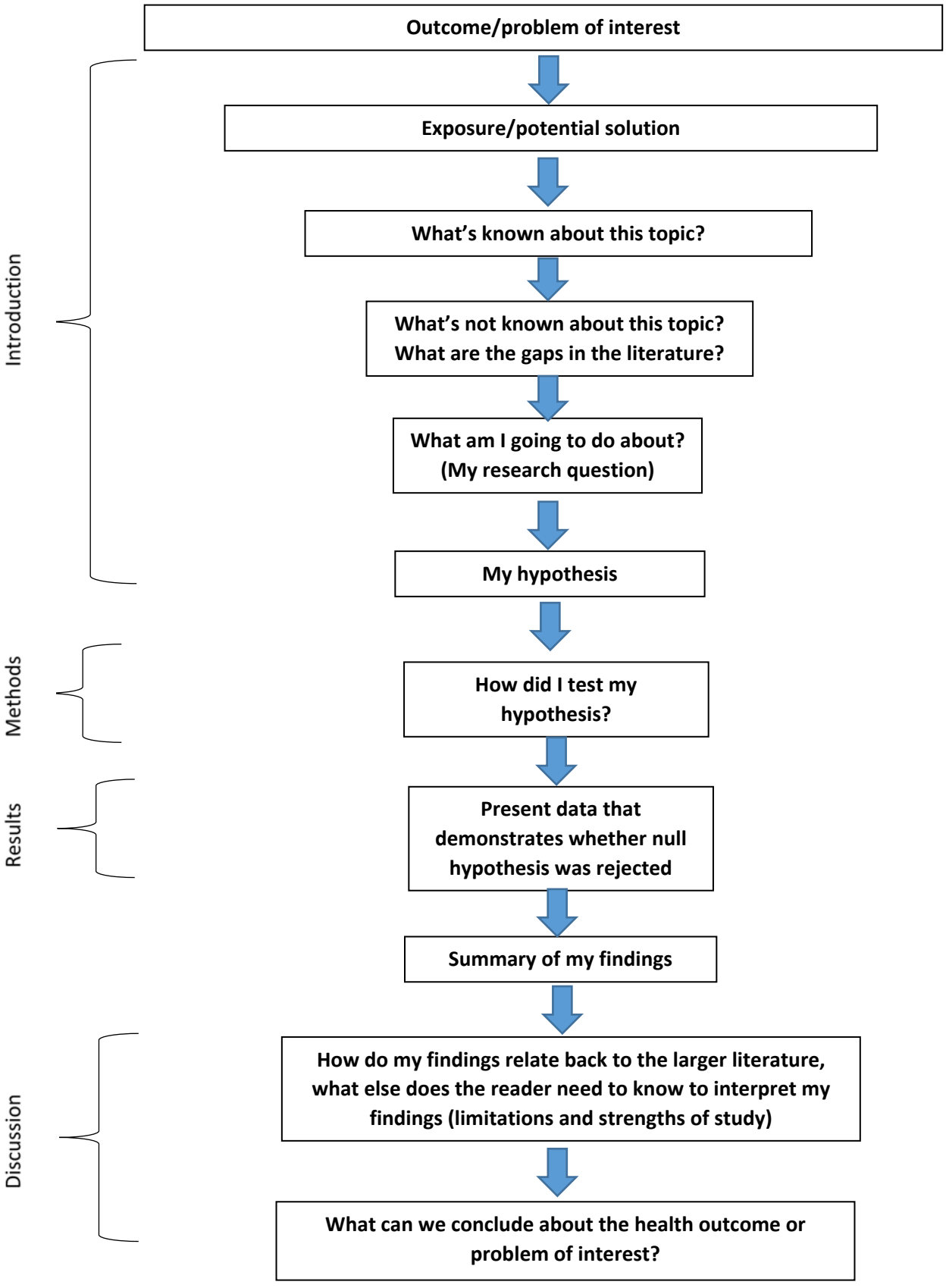
- Check journal requirements
- If you are using a citation software, double check every reference to make sure that it meets the journal requirements and that it doesn't have errors. Citation software is prone to error.

Tables

- Tables should be self-explanatory without the text
- The title should clearly state what information is displayed in the table (e.g., frequencies and percentages; odds ratios; etc.) the data source, study period, and the sample size.
- Check journal requirements for formatting of columns, etc.
- Typically, you should only have one piece of information in each cell and each column should have a clear header
- Typically, you should only have one horizontal line beneath the column headers and one at the very bottom of the table – no other lines
- Any abbreviation should be defined in the table or in a footnote
- Footnotes should follow the journal guidelines

Figures

- Figures should also be self-explanatory without the text
- Again, check and follow journal guidelines
- The title should clearly state what information is displayed in the figure (e.g., frequencies and percentages; odds ratios; etc.) the data source, study period, and the sample size.
- Clear headers for the vertical and horizontal axis
- Clear labels for both axes and any groups
- Make sure that the axes make sense and are not misleading. For example, if you are displaying percentages, the vertical axis should go from 0 to 100
- Grayscale, not color
- Eliminate unnecessary horizontal or vertical lines to clean up figure
- Again, all abbreviations should be defined in the figure or the footnotes


Introduction
Methods
Results
Discussion
Outcome/problem of interest
Exposure/potential solution
What's known about this topic?
What's not known about this topic? What are the gaps in the literature?
What am I going to do about? (My research question)
My hypothesis
How did I test my hypothesis?
Present data that demonstrates whether null hypothesis was rejected
Summary of my findings
How do my findings relate back to the larger literature, what else does the reader need to know to interpret my findings (limitations and strengths of study)
What can we conclude about the health outcome or problem of interest?