Writing for Publication: A Review of Key Elements to Include and Common Errors to Avoid

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Presentation Outline

1. Introduction
2. Common critiques from peer reviewers
3. Key elements of publishable manuscripts
4. Common QUAL research methods
5. Common statistical procedures
6. Deciding where to submit your manuscript
7. Resources
8. Questions
Introduction
• Before publishing results from your research first you must conduct the research -- this phase is key to yielding quality results/findings and ultimately getting those data published
  • Garbage In = Garbage Out

• To help ensure a solid research design is implemented, it is always best to include a methodologist on the research team from Day 1
• Assuming quality data are acquired through a well-designed study, when it comes time to publish your findings there are two overarching things to remember:

1. Follow author guidelines – 80% of publishing is following the rules
2. Two pillars of scientific inquiry – transparency and replicability. These two concepts should guide your writing, ALWAYS.
Common critiques from peer reviewers

(AKA things to AVOID in your manuscripts)
• Lack of description of the gap in the literature researchers seek to address by the study presented (i.e., the purpose of and need for the study)

• Omission of seminal pieces in the background/literature review

• **Methods lack adequate description – sampling, data collection, measures, and analysis not described in sufficient detail**
  
  • *Study details are not transparent and study could not be replicated*
• Inappropriate study design – the methods employed do not align with the research question/purpose of the study
  • For example, authors state a research question about assessing the relationship between two variables and the study design was phenomenological
  • Research question focused on behaviors but researchers conducted interviews (and not observational methods)

• Disconnect between research design and statistical methods
  • Using advanced statistical methods when doing so provides no advantage and/or study does not have the sample size to support such methods
  • KEEP IT SIMPLE and always aim for Parsimony
• Insufficient sample
  • In a QUANT study an example is either small sample size or poor methods used to create the sample – i.e., convenience sample
  • In a QUAL study an example is lack of iterative sampling and not achieving saturation
• Lack of analytic depth in QUAL studies
  • Authors present findings but do not provide a thorough analysis of the data
• Unnecessary statistical procedures
  • Authors report MANY more statistical analyses then are needed to answer the research questions/focus of the study
• Data quality concerns
  • For QUANT studies often an issue of representation and/or generalizability
  • For QUAL studies this concern is reflected when researchers impose their views on the data or lack of any data verifying techniques
• Directional hypotheses but non-directional statistical tests
• With QUAL studies, no information on the background, training, and preconceptions of the researchers who completed the study
• Authors do not know the literature and/or understand how to make a key contribution to the field
  • There are two ways to advance a field – apply new methods to old questions or answer new questions
  • When advancing the field by examining new questions, it is ok for there to be limitations with the sample but not ok to have sample limitations for a study that answers old questions without new methods

• Substantive and clear discussion regarding the specific (practical) implications of the findings for school health (for articles submitted to *Journal of School Health*)
Key elements of publishable manuscripts
1. Concise abstract

- Abstracts should be concise and comprehensive overviews of the content of the article

- Well crafted abstracts include:
  - Purpose of the research
  - The sample, including sample size
  - Primary methods employed
  - Basic findings of the study, including statistical and practical significance (for QUANT research)
  - Brief statements about conclusions or implications of findings
2. Compelling introduction and well-specified research questions

- Following informative and concise abstracts, well-reasoned introductions will determine whether individuals spend their time reading complete articles.

- Straightforward and compelling introductions situate investigators’ questions in the extant literature and enhance the utility of studies for both interested researchers and practitioners.
• Appropriate research methods are necessary but not sufficient to warrant dissemination of information.

• Many “seasoned” researchers and practitioners may respond with the proverbial “so what” if they are unconvinced by authors’ reasoning about the importance of their research questions

• Authors should develop clear descriptions of meaningful problems and explain how their research questions will begin to address those existing issues (i.e., deal with the “gap” in the literature)

• After discussing the importance of applied problems or issues through a concise review of the relevant literature, conclude the introduction with an explicit presentation of research questions, and when applicable hypotheses
Goals for the method section

• After reading well-written methods, readers should understand exactly how investigators conducted their studies including
  (a) who was included and excluded from participation,
  (b) what measures were obtained,
  (c) how and where data were collected, and
  (d) which analytic and statistical procedures were used

• Careful delineation of these procedural details allows readers to judge the scientific merits of studies and any inferences and recommendations provided by investigators
3. Method section: Sub-section on participant information

- Samples of participants should be described as specifically as possibly in terms of demographic factors and other relevant characteristics
  - Characteristics that are related to their research questions
  - Inclusion and exclusion criteria that were employed
- Ask yourself --- could someone replicate the study based on the information in this section? If “no” add more details.
4. Method section: Sub-section on sampling procedures

• Sampling procedures should be explicitly disclosed and include specific strategies employed for sampling (e.g., stratified random samples, purposive samples, convenience samples) along with participation and response rates, and prevalence of self-selection

• Because sampling procedures can be influenced greatly by contextual conditions related to investigations, where and under what circumstances data collection occurred should be clearly communicated
• Provide clear explanations for sample sizes
• Specifically, need to report information on *a priori* power analysis
  • Was it done?
  • If so, how? What software? What parameters were used? Etc.
• If *a priori* power analyses were not conducted, need to be cognizant of and prepared to discuss the implications of being underpowered when making inferences based on their results
• Rates of attrition or nonparticipation during studies should also be reported
• Basic information on Institutional Research Board and community agency approval and any other relevant procedures that affect participants enrollment also need to be openly delineated (e.g., incentives used with participants, safety measures employed)
5. Method section: Sub-section on well-specified measures

• This section should be a “road map” for what assessments, instruments, and observations were employed as well as specifics about how the measures were used

• For QUAL research, this section needs to clearly state and provide reasons why the data collection method was used – ideally link the rationale back to the research questions
• Descriptions of measures should include:
  (a) operational definitions for the variables of interest;
  (b) the names and types of measures and instruments (e.g., standardized assessments, direct observations, survey questionnaires, structured interviews, study developed measures); and
  (c) details and sequences of measurement procedures, especially any experimental manipulations.
• These procedural details are the how, when, and by whom specific measures were administered.
• When using previously known and standardized measures, provide relevant existing psychometric information (e.g., norms, recent illustrative studies) and basic reliability and validity information.

• In addition, researchers should report reliability and validity information for the measures from their samples (e.g., interrater or interobserver agreement, Cronbach alpha, concurrent validity with relevant measures).
• When applicable, report any researcher developed measures including:
  • Details about the developmental activities and reliability and validation procedures performed along with accompanying findings (i.e., pilot testing results for measures)
  • With respect to transparency and replication, reporting these procedural details are imperative in allowing readers to evaluate the quality and the validity of results as well as any interpretations and recommendations based on the findings
• Describe details regarding data collection training and retraining employed prior to and during the research study
  • What measures were trained,
  • Who was trained, how were the researchers trained,
  • How was training determined to be successful (e.g., criteria reached before administration of research protocols).

• When data collection procedures include observations or other procedures that require relatively high degrees of observer inferences, authors need to delineate how agreement between assessors was determined both before and during studies (e.g., point-by-point observer agreement ratios, interclass correlation coefficients)
6. Method section: Sub-section on analytic procedures

• Delineate the statistical and analytic procedures employed:
  • (a) the specific techniques used in relation to questions,
  • (b) the sequence of analytic procedures performed, and
  • (c) the statistical programs and software versions employed.

• When reporting statistical analyses and procedures in narratives, the amount of detail needed simply cannot be overemphasized.
  • For example, not only do you need to note that regression procedures were employed to answer specific research questions; you also should report what type of regression techniques were used (e.g., ordinary least squares, stepwise) and why those specific procedures were most appropriate given their research questions.
• Quantitative investigators should recognize underlying assumptions (e.g., homogeneity of variance, independence, normality) and discuss how you considered those assumptions and whether you empirically examined the tenability of the basic assumptions.

• When assumptions are not tenable, researchers should clearly show the accommodations made for their data analyses and discuss how those modifications might affect the interpretations of results.

• Information on missing data, especially systematically missing information, and how you treated those missing data (e.g., list-wise deletion, multiple imputation procedures).
• For QUAL studies important information to include:
  • Transcription – how thorough was the transcription and what instructions were given to the transcribers?
  • How was the analysis constructed – was it based on personal intuitive interpretation or were some formal procedures applied
  • Verification – which measures were taken to ensure validity of the findings
  • Were categories identified from theory or preconceptions in advance or were they developed from the data?
7. Well-organized results

• Present findings by research questions – this assists readers in understanding the resultant data and its connection to research questions

• Refrain from interpreting or discussing results at this point – just clearly state the findings

• Strategically and judiciously use tables and figures to present the findings
  • Tables and figures should be able to stand-alone so readers can understand the information as presented, without necessarily referring extensively to the authors’ narrative
• When reporting findings from inferential statistical procedures, use caution in the language used - for example, when results are not statistically significant, avoid “accepting or even implying that you are accepting the null hypothesis.”

• A lack of statistical significance does not mean that the null hypothesis is true; it means that there is not enough evidence to suggest that it is not true.

• For QUAL results, do not report lengthy quotes from participants – doing so shows a lack of depth in the research
• Key information to report as part of the results for inferential statistics:
  • Test statistics employed (e.g., $t$, $F$, $\chi^2$) -- obtained magnitudes of the test statistics, degrees of freedom, the obtained probability values of the test (regardless of whether the test is or is not statistically significant), measures of the effect sizes with direction of effects, and confidence intervals for both parameter estimates and effect sizes
  • Report the obtained probability values (i.e., the exact $p$-values) rather than simply stating that obtained values was less than predetermined alpha levels (e.g., $p < .05$, $p < .01$) -- including exact probability values allows readers to evaluate results for themselves.
8. Discussion section that interprets findings

• Do not merely restate your results
• Provide thoughts and insights to better explain and interpret findings
• Discuss how results support or fail to support research questions
  • Expected findings
  • Unexpected findings
  • Unintended findings
• By focusing on the three types of findings, it helps invite readers to “think along with them”
Expected findings

• When discussing results that support your research question/hypotheses, it is important to be careful and remember to not overstate or over-generalize results.

• Your interpretations and recommendations must be logically linked to both the extant evidence base and the “data at hand.”

• Remember fact that statistical significance is different from practical significance, especially in applied research. Therefore, authors should ground their Discussion and any interpretations and recommendations on both statistical and practical perspectives.
Unexpected findings

• When your findings contradict your thinking and experiences, you should attempt “to make sense” of your findings

• This should be done for both statistically significant and non-statistically significant findings

• Limiting the discussion of contradictory results also might limit progress of the field as a whole

• Conflicting results may indicate that questions are not well formulated, not yet answered, or theoretical perspectives need further exploration
Unintended findings

• Sometimes-unintended relationships or findings that are important to research questions may be identified.

• Do not ignore them, however, because such findings were not a primary focus of researchers’ efforts; they should be viewed and discussed much more cautiously than findings directly related to the study’s research questions.

• For example, spurious relationships, mediating effects, and influences of unknown lurking variables may be associated with unintended findings.
9. Study limitations, implications, and conclusions

• Focusing on limitations of the study, implications for researchers, implications for practitioners, and conclusions (in separate sub-sections) are helpful in framing and elaborating your discussions

• DO NOT IGNORE LIMITATIONS
  • All applied research investigations have multiple limitations and those potential problems related to internal and external validity need to be explicitly acknowledged and discussed.
  • Limitations per se do not prevent publication of well thought out investigations and clear reporting of results from those investigations.
In the Implications for Researchers section, authors can present next logical lines of inquiry based on their and others’ findings (e.g., types of replications needed to better generalize procedures and results, how to take procedures to scale).

Moreover, while acknowledging a study’s weaknesses authors might concentrate on how those potential problems can be addressed in future studies.
• In the Implications for Practitioners, explicitly discuss how findings translate into acceptable, feasible, and useable procedures for practitioners

• Discussions of how findings and recommendations promote the translation of findings from research into practice are often sorely needed

• End the discussion section with a Conclusions subsection in which you clearly communicate the practical significance of your findings and recommendations
Common QUAL research methods
<table>
<thead>
<tr>
<th>Method</th>
<th>Focus</th>
<th>Sample Size</th>
<th>Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnography</td>
<td>Context or culture</td>
<td>—</td>
<td>Observation &amp; interviews</td>
</tr>
<tr>
<td>Narrative</td>
<td>Individual experience &amp; sequence</td>
<td>1 to 2</td>
<td>Stories from individuals &amp; documents</td>
</tr>
<tr>
<td>Phenomenological</td>
<td>People who have experienced a phenomenon</td>
<td>5 to 25</td>
<td>Interviews</td>
</tr>
<tr>
<td>Grounded Theory</td>
<td>Develop a theory from grounded in field data</td>
<td>20 to 60</td>
<td>Interviews, then open and axial coding</td>
</tr>
<tr>
<td>Case Study</td>
<td>Organization, entity, individual, or event</td>
<td>—</td>
<td>Interviews, documents, reports, observations</td>
</tr>
</tbody>
</table>
Common statistical procedures

stat table.pdf
How to handle small samples

- The statistical methods in the previous slides are all based on large sample theory – thus, when you have a small sample you need to use different methods
  - Non-parametric statistics
  - Focus on effect sizes and not statistical significance
  - Acknowledge the small sample as a limitation!!!
- How small is too small depends on your research question – always perform A PRIORI power analysis
  - General guideline for simple procedures such as an independent means t-test is $n \geq 30$
  - For multiple linear regression $n = 10$ for every predictor in the model
Non-parametric statistics

• Independent Means T-Test $\rightarrow$ Mann-Whitney Test
• One-Way ANOVA $\rightarrow$ Kruskal-Wallis Test
• Dependent Means T-Test $\rightarrow$ Wilcoxon Signed Rank Test
• Repeated Measures ANOVA $\rightarrow$ Friedman Test
How to handle clustered data

• Clustered data violate the assumption of independence that is required for inferential statistics
• If data are clustered you must account for this
• Depending on study design there are two options:
  • Including unit of clustering as a covariate in analyses
  • Multilevel modeling if the study design meets assumption that the higher units where participants are clustered is a random sample of all possible units
  • Robust standard errors – these are available in statistical software packages using “survey” procedures
Deciding where to submit your manuscript
Many publish their research in the journals where the literature that they reference has been published.

Sometimes you might not know the best place to publish your research.

Journal/Author Name Estimator (JANE)
- [http://jane.biosemantics.org/](http://jane.biosemantics.org/)
- By entered the title and/or abstract, Jane will search journals based on documents in PubMed and produce a list of suggested journals for you to submit to.
- You can also search Jane by key words to help you identity relevant articles to cite in your paper.
A few resources

• Great guide on statistics and QUANT research: [http://www.statstutor.ac.uk/resources/uploaded/tutorsquickguidestatistics.pdf](http://www.statstutor.ac.uk/resources/uploaded/tutorsquickguidestatistics.pdf)


Questions
• Thank you for your attendance and participation this afternoon.

• Please ask questions now or if you have questions in the future, you can always ask me: babell@sc.edu