Reporting Research & Evaluating Studies

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About this Class

- Overview of key concepts
- Reporting guidelines for authors
- Checklists for reviewers
- Additional resources

Reporting Research and Evaluating Studies Guide
galter.northwestern.edu > Explore Galter > Guides > Evidence-Based Practice > Reporting Research and Evaluating Studies
Poor Reporting

- Missing Information
- Ambiguity
- Misrepresentation

10 of 100 of papers clearly stated the purpose of the study in the Introduction.

Gender was not reported in 11% of papers.

20% of papers introduced new statistical methods in the results section.

A systematic survey of the quality of research reporting in general orthopaedic journals.

Parsons et al, J Bone Joint Surg Br 2011

Impact of Poor Reporting

- Delayed publication
- Bias results and misleading information published
- Adverse effects on researchers, clinicians, and patients
## What to Report

- Methodology
- Results
- Potential conflicts

### Reporting Methods

The PICO framework is a great tool for identifying key methodological information.

<table>
<thead>
<tr>
<th>P</th>
<th>Patient/Population/Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Important characteristics – Inclusion/exclusion criteria – Sample size – Recruitment and assignment – Address confounders</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I</th>
<th>Intervention or Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Explicit mention of the intervention or exposure. This can be a treatment, procedure, diagnostic test, prognostic factors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C</th>
<th>Comparator</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Main alternative to compare with the intervention. This is often optional and can be a placebo.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>O</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Description of what you hope to accomplish, measure, improve or affect. Mention primary and secondary outcomes.</td>
</tr>
</tbody>
</table>
What to Report

Results

Inferences
Demonstrate statistical significance
Confidence interval, P-value
Type I error, Type II error

Estimates
Calculate or judge the value, number, quantity, or extent of.
Relative risk (RR), Odds ratio (OR)

Adjustments
Account for differences between groups
Stratification, Multivariate models, Logistic regression, Linear regression

Bias
Identify & Address Bias

Bias in Research
Pre
- Selection
- Allocation
- Detection
During
- Performance
- Interviewer
- Attrition
Post
- Outcome reporting
- Citation
- Publication
What to Report
Potential Conflicts

Conflicts of Interests

Acknowledge potential conflicts
• Disclosure statements
• Funding sources

Reporting Guidelines

- Recommend the minimum set of information
- Specific to a study design
- Checklists, flow diagrams, or structured text
- Usually include “explanation and elaboration”
Reporting Guidelines

- Based on evidence
- Developed by consensus
- Provide guidance not requirements
- Remember - cite your reporting guideline!

**Benefits**

- Improve accuracy and transparency of research
- Promote replication by researchers
- Improve efficiency of literature searching
- Enable readers to critically appraise the study
- Help clinicians apply research to clinical decision-making
Reporting Guidelines

GENERIC & SPECIFIC

Reporting Guidelines “Generic”

- Generally applicable
- Developed around a study design
- Include key methodology features

CONSORT  STROBE  PRISMA  SQUIRE

“Generic” Reporting Guidelines
Reporting Guidelines
“Specific”

- Include greater degree of specificity
- Designed around a specific condition/field/intervention
- Used with relevant generic guideline

i.e., Reporting guidelines for implementation research on nurturing care interventions designed to promote early childhood development.

<table>
<thead>
<tr>
<th>Section</th>
<th>Item #</th>
<th>Item label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods</td>
<td>8</td>
<td>Intended intervention</td>
<td>Describe the intervention in the intervention condition and the comparison condition. Include: (1) Summary of any formative research or piloting to design or adapt the intervention.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>content</td>
<td>(2) Information about the curriculum used (i.e., adaptations, translations, manuals, and job aids) and content.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(3) Describe the theory of change, conceptual model, or framework on which the intervention is based (e.g., behavior change theory).</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(4) List any behavior change techniques employed (e.g., information sharing, problem solving, performance, social support, distribution of materials, and visual aids).</td>
</tr>
</tbody>
</table>
Sources of Reporting Guidelines

- Equator Network
- For author pages
- Published studies
- Galter Library Guide

The EQUATOR mission is to achieve accurate, complete, and transparent reporting of all health research studies to support research reproducibility and usefulness.

Consists of:
- Researchers
- Editors
- Peer reviewers
- Developers of reporting guidelines
- Research funding bodies
- Other collaborators

https://www.equator-network.org/
Good reporting is not an optional extra: it is an essential component of doing good research

Vellore, 11 January 2010
Critical appraisal is the process of carefully and systematically examining research evidence to judge its trustworthiness, its value and relevance in a particular context.


Evaluating Published Studies
Critical Appraisal

- Assess methodological soundness
  - Does this study address a clearly focused question? Remember PICO
  - Did the study use valid methods to address this question?

- Evaluate results and interpretations
  - Are the results valid?
  - Are the interpretations accurate?
Evaluating Published Studies
Critical Appraisal

Identify and assess bias

- Did the study use valid methods to address their question?
- Do the authors address potential sources of conflict?

Bias in Research

Pre
- Selection
- Allocation
- Detection

During
- Performance
- Interviewer
- Attrition

Post
- Outcome reporting
- Citation
- Publication

Determine relevancy

- Is the study design appropriate for the research question?
  - Check out the Oxford CEBM – Levels of Evidence
- Are the valid results of this study important?
- Are the results applicable to your patient, population, or problem?
Critical Appraisal Checklists

- Developed around a study design
- More concise with fewer checklist items
- Based on evidence
- Developed by consensus

Bias

<table>
<thead>
<tr>
<th>Allocation</th>
<th>Difference participants in how participants are assigned (allocated) to treatment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attrition</td>
<td>Differences between groups in withdrawals from a study.</td>
</tr>
<tr>
<td>Detection</td>
<td>Differences in how outcomes are assessed between study groups.</td>
</tr>
<tr>
<td>Performance</td>
<td>Systematic differences between groups in the care that is provided, or in exposure to factors other than the interventions of interest.</td>
</tr>
<tr>
<td>Selection</td>
<td>Differences between the groups that are compared.</td>
</tr>
</tbody>
</table>
Additional Resources

- Calculators
- Books and articles
- Galter Library Guide

References

- Richards, D. (2009). GRADING--levels of evidence. Evid Based Dent, 10(1), 24-25. doi:10.1038/sj.ebd.6400636
References

- https://pdfs.semanticscholar.org/2fd0/61a3491357e604ae5fbc86dd9f34ae6ce74.pdf
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1768356/
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4897386/

Thank you
Questions?