How to write and publish a paper

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Adrian Aldcroft, Editor in Chief, BMJ Open
Writing research papers and using reporting guidelines

- Resources
- IMRaD
- Writing style
# Research to Publication

## Courses & Modules List

### Free Modules

- **How to write & publish a study protocol**
  Understand different meanings of the term "protocol": Communicate the value of planned research: Appreciate the character...

- **Introduction to randomized blinded trials**
  Define randomized blinded trials: Explain how to design RBTs: Describe how to choose the intervention and control condition...

### How to Write a Paper

- What Editors and Peer Reviewers look for
- Publication Ethics
- Designing Clinical Research
- Responsible Conduct of Research
- Introduction to Clinical Trials
Core guidance on writing papers

• International Committee of Medical Journal Editors recommendations for manuscripts submitted to biomedical journals
  http://www.icmje.org/recommendations/browse/manuscript-preparation/preparing-for-submission.html

• Reporting guidelines for research, at the EQUATOR network
  http://www.equator-network.org/
ICMJE guidelines on manuscript preparation

The International Committee of Medical Journal Editors (ICMJE) is a small working group of general medical journal editors that meets annually to work on the Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals.

EQUATOR network

- Enhancing the QUAlity and Transparency Of health Research
EQUATOR Network and Penelope

- Tool to help choose a report and complete a checklist
  - http://www.goodreports.org/

- Tool integrated with BMJ Open to help authors submit their paper
  - https://app.penelope.ai/manuscript-check/bmj_open
### Guideline checklist example: STROBE

**STROBE Statement**—checklist of items that should be included in reports of observational studies

<table>
<thead>
<tr>
<th>Item No</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title and abstract</strong></td>
<td>(a) Indicate the study’s design with a commonly used term in the title or the abstract. (b) Provide in the abstract an informative and balanced summary of what was done and what was found.</td>
</tr>
<tr>
<td><strong>Introduction</strong></td>
<td>2 Explain the scientific background and rationale for the investigation being reported.</td>
</tr>
<tr>
<td><strong>Objectives</strong></td>
<td>3 State specific objectives, including any prespecified hypotheses.</td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>4 Present key elements of study design early in the paper.</td>
</tr>
<tr>
<td><strong>Setting</strong></td>
<td>5 Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection.</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>6 (a) Description of the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up. Case-control study—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choices of cases and controls. Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants. (b) Cohort study—For matched studies, give matching criteria and number of exposed and unexposed. Case-control study—For matched studies, give matching criteria and the number of controls per case.</td>
</tr>
<tr>
<td><strong>Variables</strong></td>
<td>7 Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.</td>
</tr>
<tr>
<td><strong>Data sources/ measurement</strong></td>
<td>8* For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group.</td>
</tr>
<tr>
<td><strong>Bias</strong></td>
<td>9 Describe any efforts to address potential sources of bias.</td>
</tr>
<tr>
<td><strong>Study size</strong></td>
<td>10 Explain how the study size was arrived at.</td>
</tr>
<tr>
<td><strong>Quantitative variables</strong></td>
<td>11 Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why.</td>
</tr>
<tr>
<td><strong>Statistical methods</strong></td>
<td>12 (a) Describe all statistical methods, including those used to control for confounding. (b) Describe any methods used to examine subgroups and interactions. (c) Explain how missing data were addressed. (d) Cohort study—If applicable, explain how loss to follow-up was addressed. Case-control study—If applicable, explain how matching of cases and controls was addressed. Cross-sectional study—If applicable, describe analytical methods taking account of the sampling strategy.</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>13* (a) Report numbers of individuals at each stage of study—e.g. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed. (b) Give reasons for non-participation at each stage. (c) Consider use of a flow diagram.</td>
</tr>
<tr>
<td><strong>Descriptive data</strong></td>
<td>14* (a) Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders. (b) Indicate number of participants with missing data for each variable of interest. (c) Cohort study—Summarise follow-up time (e.g. average and total amount).</td>
</tr>
<tr>
<td><strong>Outcome data</strong></td>
<td>15* (a) <strong>Cohort study</strong>—Report numbers of outcome events or summary measures over time. Case-control study—Report numbers in each exposure category, or summary measures of exposure. Cross-sectional study—Report numbers of outcome events or summary measures.</td>
</tr>
<tr>
<td><strong>Main results</strong></td>
<td>16* (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g. 95% confidence interval). Make clear which confounders were adjusted for and why they were included. (b) Report category boundaries when continuous variables were categorized. (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period.</td>
</tr>
<tr>
<td><strong>Other analyses</strong></td>
<td>17 Report other analyses done—e.g. analyses of subgroups and interactions, and sensitivity analyses.</td>
</tr>
<tr>
<td><strong>Discussion</strong></td>
<td>18 Summarise key results with reference to study objectives.</td>
</tr>
<tr>
<td><strong>Key results</strong></td>
<td>19 Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias.</td>
</tr>
<tr>
<td><strong>Interpretation</strong></td>
<td>20 Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence.</td>
</tr>
<tr>
<td><strong>Generalizability</strong></td>
<td>21 Discuss the generalizability (external validity) of the study results.</td>
</tr>
<tr>
<td><strong>Other information</strong></td>
<td>22 Describe the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based.</td>
</tr>
</tbody>
</table>

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

IMRaD structure for research papers

- **Introduction**: why ask this research question?
- **Methods**: what did I do?
- **Results**: what did I find?
- and
- **Discussion**: what might it mean?

Austin Bradford Hill, BMJ 1965
IMRaD structure: Introduction

• Brief background for this audience
• 3-4 paragraphs only: mind the word limit
• What’s known/not known on research question
• Don’t bore readers, editors, reviewers
• Don’t boast about how much you have read

The research question
• State it clearly in last paragraph of introduction
• State why the question matters
IMRaD structure: Methods I

- Should be like a recipe
- Most important section for informed readers
- Follow reporting guidelines, e.g., CONSORT Statement
- Describe measures to ensure ethical conduct
- Fully describe and give references for lab/stats methods
- Question: How detailed do you think the methods should be?
IMRaD structure: Methods II

• Describe **PECO/PICO** elements of the study:
  • **P** - which patients, which population, what problem(s)?
  • **I or E** - which intervention(s) or exposure(s)?
  • **C** – which comparison group? Any randomisation or stratification?
  • **O** - what outcome(s) or endpoint(s)? Define primary and secondary outcome(s)
Ethical aspects to consider in the Methods section

Ethics aspects of methods:
• What was the consent procedure?
• Were there any deviations from normal practice?
• Might publication reveal patients’ identities?
• What burden was imposed?
• What are the risks and benefits for participants/others?
• How might society or future patients benefit in time?
IMRaD structure: Results

- Report results fully & honestly, as pre-specified
- Text (story), Tables (evidence), Figures (highlights)
- Report primary outcomes first
- Give confidence intervals for main results
- Report essential summary statistics
- Leave out non-essential tables and figures; these can be included as supplementary files
- Don’t start discussion here
IMRaD structure: Discussion

• Don’t simply repeat the introduction. Include the following:
  • Statement of principal findings
  • Strengths & weaknesses of the study
  • Strengths & weaknesses in relation to other studies & key differences
  • Possible mechanisms & explanations for findings
  • Potential implications for clinicians or policymakers
  • Unanswered questions and future research
Abstracts

- Often the only part of the study that will be read
- All authors must approve it
- Editors may screen papers based on the abstracts

- Structured abstracts for The BMJ need:
  - 300-400 words
  - Structured format
  - Active voice
  - Results plus p values
  - %s with denominators
  - No references
  - Trial registration details
Structured abstracts

Post-traumatic stress, anxiety and depression following miscarriage or ectopic pregnancy: a prospective cohort study

Jessica Farren¹, Maria Jalmbront², Lieveke Ameye¹, Karen Joash¹, Nicola Mitchell-Jones¹, Sophie Tapp¹, Dirk Timmerman³,⁵, Tom Bourne¹,³,⁵

Abstract

Objectives: This is a pilot study to investigate the type and severity of emotional distress in women after early pregnancy loss (EPL), compared with a control group with ongoing pregnancies. The secondary aim was to assess whether miscarriage or ectopic pregnancy impacted differently on the type and severity of psychological morbidity.

Design: This was a prospective survey study. Consecutive women were recruited between January 2012 and July 2013. We emailed women a link to a survey 1, 3 and 9 months after a diagnosis of EPL, and 1 month after the diagnosis of a viable ongoing pregnancy.

Setting: The Early Pregnancy Assessment Unit (EPAU) of a central London teaching hospital.

Participants: We recruited 186 women. 128 had a diagnosis of EPL, and 58 of ongoing pregnancies. 11 withdrew consent, and 11 provided an illegible or invalid email address.

Main outcome measures: Post-traumatic stress disorder (PTSD) was measured using the Post-traumatic Diagnostic Scale (PDS), and anxiety and depression using the Hospital Anxiety and Depression Scale (HADS).

Results: Response rates were 69/114 at 1 month and 44/83 at 3 months in the EPL group, and 20/50 in controls. Psychological morbidity was higher in the EPL group with 28% meeting the criteria for probable PTSD, 32% for anxiety and 16% for depression at 1 month and 38%, 20% and 5%, respectively, at 3 months. In the control group, no women met criteria for PTSD and 10% met criteria for anxiety and depression. There was little difference in type or severity of distress following ectopic pregnancy or miscarriage.

Conclusions: We have shown a large number of women having experienced a miscarriage or ectopic pregnancy fulfill the diagnostic criteria for probable PTSD. Many suffer from moderate-to-severe anxiety, and a lesser number depression. Psychological morbidity, and in particular PTSD symptoms, persists at least 3 months following pregnancy loss.
Question: With the technology available today, should we still be using the IMRaD structure?

- There are new opportunities (e.g., video abstracts and methods, publishing datasets)
- There have been changes to research article format (data and PPI statements)
- However there is a logic and simplicity that makes the IMRaD structure relevant today
Why publish study protocols?

Why publish study protocols?
- Keep researchers and funding bodies up-to-date
- Enable collaboration amongst the research community
- Prevent unnecessary duplication of work
- Increase transparency by making more information available than required by trial registries
- Give others the opportunity to see and understand deviations that occur during the study
- Increase transparency and trust
Publishing study protocols in BMJ Open

- Protocol manuscripts should report planned or ongoing research studies. We will not consider study protocols for research that is complete or nearing completion.
- If available, use reporting guidelines specific to study protocols (e.g., SPIRIT and PRISMA-P)
Publishing study protocols in *BMJ Open*

- Broadly use the same principles and policies as research articles, with the following differences:
  - Please include the planned dates of the study both in the manuscript and cover letter
  - Include an Ethics and Dissemination section in both the Abstract and manuscript
  - A Discussion section is not required
Peer review of study protocols in *BMJ Open*

- *BMJ Open* will consider publishing without peer review protocols that have formal ethical approval *and* funding from a recognised, open access advocating research-funding body (such as those listed by the [JULIET](#) project)
- Provide proof of peer review by the funder as part of the manuscript submission
- The intention of peer review is not to alter the study design, but to judge whether the study design is sound and to improve reporting/transparency
Choosing a journal

• Factors in choosing a journal
• Journal metrics (e.g., Impact Factor)
• Predatory journals
What journals provide: peer review & scholarly publishing
Factors to consider when choosing a journal

- Journal scope
- Journal indexing and Impact Factor
- Language of publication
- Likelihood of acceptance
- Speed of publication
- Colleagues' advice
- Open access or not?
- Publication fees
- Editorial and peer review policies
The purpose of journals often differs

• For readers
  • Many journals focus largely on readers, choosing and commissioning articles of most interest and use to particular types or group of readers (eg The BMJ, BMJ Supportive and Palliative Care). These may appear online as well as in print, and may provide Open Access.

• For authors and funders
  • Some newer “megajournals” focus on providing authors with a fast, fair peer review process; relatively high acceptance rates, rapid online only publication; and Open Access, e.g., BMJ Open, PeerJ, F1000 Research.
Impact Factor: Questions

• Do you use the Impact Factor when selecting a journal (either as an author or a reader)?
• Do you think journals with a high Impact Factor are “better”?
• Do you know what the Impact Factor represents?
Impact Factor

The 2017 IF for a journal is calculated using the following ratio:

\[
\frac{\text{Total citations to scholarly articles (published in 2015 and 2016) in 2017}}{\text{Number of citable articles in the journal in 2015 and 2016}}
\]
Impact Factors

• An Impact Factor of 1.0 means that, on average, the articles published 1-2 years ago have been cited one time.
• An Impact Factor of 2.5 means that, on average, the articles published 1-2 years ago have been cited 2.5 times.
• The citing works may be articles published in the same journal. However, most are from different journals, proceedings, or books indexed by Web of Science.

Impact Factor: Positives

• Intuitively, it seems like a sensible metric to use to place a value on a journal
• Choosing a journal can be difficult—a quantifiable measure is extremely useful. Impact Factor has become the standard in the publishing industry.
Impact Factor: Problems

- Different journals have different objectives
- Authors and publishers play the Impact Factor “game”
- Chasing Impact Factor contributes to bias in the scientific record
- The Impact Factor can be seen as a driver for research misconduct
Limitations of Journal Impact Factor

- Skewed by a minority of highly cited articles, e.g., review articles
- Cannot be compared across fields
- Higher in research fields with literature that is cited quickly
- May be artificially inflated by “self citation” by journals
- Calculated using the SCI database that includes only some journals, with a bias towards journals in English
Alternatives: Citation distribution
Article Level Metrics

- **Article-Level Metrics** (ALMs) are a new approach to quantifying the reach and impact of published research.
- As electronic dissemination of scholarly content has surpassed print, it has become easier to disaggregate an individual article’s impact from the publication in which it appeared.
- It’s also possible to track different markers of an article’s reach, beyond just citations.
- ALMs seek to incorporate new data sources (sometimes referred to as “altmetrics”) along with traditional measures to present a richer picture of how an individual article is being discussed, shared, and used.

http://sparcopen.org/our-work/article-level-metrics/
Altmetrics

The Altmetric Attention Score and donut are designed to help you easily identify how much and what type of attention a research output has received. You might come across them on publisher article metrics pages, institutional repositories, or even individual researcher or lab publications pages.

You can always click on the donut to visit the details page for the research output, to see the original mentions and references that have contributed to the attention score.

The colors of the Altmetric donut each represent a different source of attention:

- Policy documents
- News
- Blogs
- Twitter
- Post-publication peer-reviews
- Facebook
- Sina Weibo
- Wikipedia
- Google+
- LinkedIn
- Reddit
- Faculty1000
- Q&A (stack overflow)
- Youtube
- Pinterest

The amount of each color in the donut will change depending on which sources a research output has received attention from:

www.altmetric.com/about-our-data/the-donut-and-score/
Predatory journals

- These are publications taking fees without providing robust editorial or publishing services.
- They recruit articles through aggressive marketing and spam emails, promising quick review and open access publication for a price. There is little if any quality control and virtually no transparency about processes and fees.
- Their motive is financial gain, and they are corrupting the communication of science.

Firm action needed on predatory journals

*BMJ* 2015; 350 doi: http://dx.doi.org/10.1136/bmj.h210 (Published 17 January 2015)

Cite this as: *BMJ* 2015;350:h210

Jocelyn Clark, executive editor and assistant professor of medicine, Richard Smith, chair
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3. USE YOUR ORCID ID
   Include your ORCID identifier on your Webpage, when you submit publications, apply for grants, and in any research workflow to ensure you get credit for your work.
Common issues with Chinese submissions

• Not using a reporting guideline or tailoring the manuscript to the Instructions for Authors
  • Solution: Use the EQUATOR guidelines and Penelope tool
• Unclear timeframe/study design
  • Solution: More detailed methods sections (including timeframes). Publishing/providing study protocols
• Not including limitations
  • Solution: Be honest
• Publication ethics (e.g., plagiarism, authorship changes)
  • Solution: Be up front and honest—editors can be harsh when this issues are uncovered at a late stage
Thank you