

# A revised checklist for writing up research reports

*As a service to readers we present a checklist for writing up research reports in the field of Addiction. This is part of an ongoing effort to improve the quality of initial submissions.*

At *Addiction*, we recognize that potential contributors vary widely in experience and training at writing up research reports. It is difficult to remember all the elements and rules that make a good research report; even experienced researchers sometimes forget to include important information. Add to this the fact that many of our contributors are not native English speakers, and it is not surprising that much of the time of the regional editor is spent liaising with contributors to ensure that manuscripts meet the journal's requirements. We have been looking for ways of helping potential contributors write up papers in a way that gives referees the information they need to assess the quality of the research and minimizes the changes that need to be made before publication.

Some professional bodies, such as the American Psychological Association (APA), have detailed publication manuals, specifying all aspects of structure, style and language. Such detail has the benefit of giving a uniform appearance to papers, but at times can seem unnecessary and place an unreasonable burden on potential authors.

Journals such as the *BMJ* and *JAMA* have taken the route of specifying checklists for authors to ensure that they include important information and we have studied these as a possible labour-saving device (see e.g. <http://www.equator-network.org/>). Although these serve a useful purpose, and we encourage their use, we felt that they did not fully meet our needs because they do not cover the range of research designs we encounter; they impose somewhat rigid rules on reporting that are sometimes not appropriate to the study in hand; and do not cover some common problems with submitted manuscripts.

We decided therefore to update our own checklist, which we have adapted for our topic area, and this is presented in the Appendix. The checklist has been designed to be for guidance only, bearing in mind that in certain cases (such as reviews and qualitative reports) some of the rules will not be relevant. It was also designed to be applicable beyond addiction research and indeed to cover many types of clinical, social and behavioural research. It is not a handbook on writing papers and does not cover important technical features that are required in research reports—rather, it is an *aide memoire* addressing many of the most common problems that we encounter. It should be useful to potential contributors and to our referees and editors. Some of the items may seem trivial (e.g. ensuring

that results are presented in the past tense) but they are commonly a source of additional work for the editorial staff. Others are more substantive (e.g. always reporting response rates).

If you are considering submitting a report to *Addiction* or have colleagues who might do so, we ask you to ensure that relevant items in the checklist have been covered.

## Declaration of interests

R.W. has received travel funds and hospitality from, and undertaken research and consultancy for pharmaceutical companies that manufacture or research products aimed at helping smokers to stop. S.D. declares no relevant competing interests. J.M. receives educational grant funding at King's College London via Reckitt Benckiser Pharmaceuticals (RBP) to Action on Addiction for a study of psychological interventions in opioid dependence (2010–2016); consultation to RBP (2011) and Merck Serono (2013), and honoraria as co-chair of the Improving Outcomes in Treatment of Opioid Dependence conference (2015) via educational grant funding from RBP [Indivior PLC] to PCM Scientific. K.H. serves as a paid scientific advisory board member of Aelis Farma, a company which is attempting to develop a pharmaceutical treatment for cannabis dependence. He has accepted travel costs and speaking fees from professional societies and reviewing fees from academic publishers.

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## Appendix: a checklist for writing up studies, version 2

This is not an exhaustive list of things that need to be checked when writing up a research report, but it covers many of the common types of omission or error. It is for guidance only, and not all the items may apply. This checklist should be read in conjunction with relevant guidelines

from EQUATOR and *Addiction*. See <http://onlinelibrary.wiley.com/doi/10.1111/add.12857/epdf>

### Title

- 1 Ensure that the title does not promise more than the paper can deliver (e.g. using phrases such as, 'X is superior to Y' or 'The effect of... on ...' when it should be 'Associations between ... and ...').
- 2 Ensure that the title avoids redundant phrases (e.g. 'A study of ...') but includes information that will assist discovery initial screening for systematic reviews, e.g. study design, substance investigated, population, setting, outcome of interest.

### Abstract

- 3 Use the correct structured abstract format, which is normally Aims (or Background and Aims, if appropriate), Design, Setting, Participants/Cases, Intervention and Comparator (if appropriate), Measurements, Findings, Conclusions.
- 4 State the aims as a series of estimation or comparison problems clearly, rather than using general terms such as assess, investigate or explore.
- 5 Describe the design, including the sampling or data acquisition design and control groups or conditions.
- 6 Give the geographic location (including country) and the study setting (if appropriate).
- 7 Give the number of participants involved in the analyses with dates, gender balance and some brief individual characteristics to position the study.
- 8 For trials, give a summary description of the interventions and control conditions.
- 9 Describe the measurement of the main (primary) outcome and summarize any the predictors/covariables included in the analysis. Avoid a detailed description of the statistical methods, unless these are novel and of methodological interest.
- 10 Summarize the main findings as they relate to the aims, supported with appropriate effect sizes/*P*-values/confidence intervals (usually 95%) when giving estimates or inference statements.
- 11 State the conclusions clearly as a stand-alone statement of the key results as described under Findings, avoiding abbreviations, conjecture, recommendations or musings on what future studies might try to determine.

### Introduction

- 12 Begin with a paragraph setting out the main issue(s) being addressed, set in an international context where appropriate.
- 13 Make a clear case as to why the study was needed.

- 14 Do not write an essay or review on the topic of the study.
- 15 Focus your review of prior literature tightly on findings and theories of direct relevance to the research questions rather than writing a general review of the topic of the study.
- 16 Make reference to relevant literature. Literature is relevant if it shows why the research questions are important or gives an indication of how the result may turn out. It is essential to search for and give due credit to studies of a similar nature wherever they originate and whatever their conclusions. Selective citation is a common source of bias.
- 17 Describe any necessary background information about the specific setting for the study.
- 18 Justify the choice of variables and study population.
- 19 State the aims and specific research questions clearly. The latter should be done with a numbered list if there are more than one. Use precise terms such as, 'compare', 'test the hypothesis that', 'estimate', rather than non-specific terms such as, 'assess', 'explore', 'evaluate'. The list of research questions *must* match all methods, results and conclusions precisely. *No* results or conclusions should appear anywhere in the paper unless it is linked to a research question, except in rare cases where something unexpected emerges that requires reporting.

### Methods

- 20 Structure the Methods section with subheadings (e.g. Design, Participants, Measures, Intervention(s)/Comparator), Analyses.

#### *Design*

- 21 State the design type, preferably using a standard term such as individually randomized controlled trial, cross-sectional survey, with a top-level description of the components of the study (e.g. type of comparison and outcome measures).
- 22 Provide a link to pre-registered hypotheses research questions and analysis plans.
- 23 In randomized trials state the method of randomization and in non-randomized comparisons state the basis for participant allocation, or in repeated-measures experimental designs the ordering of conditions.

#### *Participants*

- 24 State how the study sample was recruited or identified (if not actively recruited).
- 25 State and give reasons for choice of the target sample type and size, including numbers in each group if appropriate.
- 26 List inclusion and exclusion criteria for participants.

*Intervention(s)/comparator*

- 27 Describe the intervention(s) (if appropriate) and any comparison conditions fully, including the setting and characteristics of personnel delivering the intervention (see TIDIER checklist \*REF\*). Provide full information of behavioural components of any intervention in a supplementary file.

*Measures*

- 28 Describe all variables and how and when in the study these were measured and their sources if from an existing data set, indicating where possible information on validity and reliability or giving a citation where this can be found.
- 29 Provide full questionnaires and definitions and operationalizations of all variables in a supplementary file unless these are standard.
- 30 Make clear how each of the variables relates to one or more research questions stating whether it is contextual, predictor, mediator, moderator or outcome measures, and in the case of outcome measures whether it is primary or secondary.

*Analyses*

- 31 Describe all statistical methods, including modelling assumptions and the approach taken to the management of missing data.
- 32 Describe the software/routines used for analysis.
- 33 Describe statistical power calculations for relevant research questions.
- 34 Use Bayes factors if you want to claim that there was no effect or association (see editorial on Bayes \*REF\*).

**Results**

- 35 Where percentages are given, always give *ns* as well and where means are given always give standard deviations (SDs).
- 36 If there are missing data report the *ns* for every analysis in which data are missing.
- 37 Ensure that all tables and figures have titles using a consistent format and are numbered consecutively.
- 38 Cite all tables and figures in the text using a phrase such as 'Table 1 shows that ...'.
- 39 Generally present findings in terms of parameter estimates (e.g. odds ratios) and 95% confidence intervals.
- 40 If you are undertaking significance testing, state the test statistics (e.g. *t*-value, *F*-value or  $\chi^2$  value), degrees of freedom and *P*-values. Even for *P*-values greater than 0.05 it is helpful to show the exact *P*-value to aid any subsequent meta-analysis.

- 41 State exact *P*-values for primary statistical tests.
- 42 Avoid making interpretations in the Results section.

*Characterizing the sample*

- 43 State the total number of participants recruited or obtained and the numbers in each group if there are groups.
- 44 State the response rates and follow-up rates, including actual *ns*. Do this separately for any groups being compared, as well as for the sample as a whole.
- 45 Describe fully the sample obtained in terms of all variables, including statistical comparisons between groups where there are groups.
- 46 Report statistical comparisons between followed-up and non-followed-up samples where appropriate.

*Answers to research questions*

- 47 Describe the results of the analyses in terms of the answers to each research question.
- 48 Do not introduce analyses that are not linked to a research question unless it is clear that it is needed to interpret an unexpected finding.
- 49 Avoid phrases such as 'The result was not significant' (only differences and associations can be statistically significant, not 'results').
- 50 Always use meaningful labels when referring to results from individual questionnaire items (rather than just the question number).
- 51 Ensure that the main findings are presented in tables and summarized in the text without repeating the figures and statistics.
- 52 Use graphs to illustrate findings, not as the primary way of reporting them.

**Discussion**

- 53 Begin the discussion with a paragraph summarizing the main findings.
- 54 Relate the findings to any previous research in terms of whether they support or fail to support the conclusions of that research.
- 55 Explain how the findings reflect on theory, practice or policy formulation.
- 56 Examine the limitations of the study, addressing issues such as sample size, sample representativeness, measurement error, measurement bias, whether any intervention was implemented successfully, whether there was contamination between different intervention conditions and ability to generalize to other settings.
- 57 Offer explanations for apparently anomalous findings.
- 58 Refrain from reporting 'no difference' between conditions or lack of associations unless demonstrated through Bayes factors.

- 59 Do not mention findings in the Discussion section that have not been described in the Results section.
- 60 Finish with a paragraph summarizing the main conclusions in relation to the original aims.

#### References

- 61 Ensure that citations and references follow a consistent format and follow the journal's guidance to authors.
- 62 Ensure that references are complete and match the citations in the paper.
- 63 Ensure that all non-English titles are accompanied by an English translation.
- 64 Avoid citing inaccessible work, especially work reporting substantive findings.
- 65 Ensure that the references are in the required order and that web addresses are archived.

#### General

##### *Terminology*

- 66 Always use standard terminology (e.g. for labels applying to study participants such as 'Excessive drinkers') unless none exists and make clear, where appropriate, the provenance of the terms used.
- 67 Always define terms that are not standard.

##### *Style*

- 68 Always use the past tense when describing other people's findings, and your own methods and results.
- 69 Do not use colloquial expressions that would be confusing to an international readership.

- 70 Use Arabic numerals (e.g. '12', '34') except for numbers below 10 and those beginning a sentence, in which cases you spell out the numbers (e.g. 'three').
- 71 Ensure that all abbreviations are spelled out in full the first time they are used.
- 72 Refrain from making defamatory statements about specific individuals or organizations.
- 73 Refer to all information in supplementary files using 'Table S1', 'Figure S1', etc.
- 74 Avoid using shortenings such as 'don't' and 'it's'.

##### *Additional information*

- 75 Include an Acknowledgements section, stating the source of funding and thanking relevant people for their assistance.
- 76 Report any competing interests of all authors, not just those relating to funding of the current study.

##### *Formatting*

- 77 Ensure that formatting is consistent and appropriate (e.g. single blank lines between paragraphs, no indentations at the start of paragraphs, no multiple blank lines).
- 78 Ensure that tables and figures are always cited in the text and all have numbers and titles.

##### *Quality assurance*

- 79 Ensure that *all* the authors have read through the final version of the manuscript carefully to check it over.