APA Style JARS
Journal Article Reporting Standards

JARS–**Quant** | Table 9
Quantitative Meta-Analysis Article Reporting Standards
Information Recommended for Inclusion in Manuscripts Reporting Quantitative Meta-Analyses

Title and Title Page

Title

- State the research question and the type of research synthesis (e.g., narrative synthesis, meta-analysis).

Author Note

- List all sources of monetary and in-kind funding support; state the role of funders in conducting the synthesis and deciding to publish the results, if any.
- Describe possible conflicts of interest, including financial and other nonfinancial interests.
- Give the place where the synthesis is registered and its registry number, if registered.
- Provide the name, affiliation, and e-mail address of the corresponding author.

Abstract

Objectives

- State the research problems, questions, or hypotheses under investigation.

Eligibility Criteria

- Describe the characteristics for inclusion of studies, including independent variables (treatments, interventions), dependent variables (outcomes, criteria), and eligible study designs.

Methods of Synthesis

- Describe the methods for synthesizing study results, including
  - statistical and other methods used to summarize and to compare studies
  - specific methods used to integrate studies if a meta-analysis was conducted (e.g., effect-size metric, averaging method, the model used in homogeneity analysis)

Results

- State the results of the synthesis, including
  - number of included studies and participants, and their important characteristics
  - results for the primary outcome(s) and moderator analyses
  - effect size(s) and confidence interval(s) associated with each analysis if a meta-analysis was conducted

Conclusions

- Describe strengths and limitations of the evidence, including evidence of inconsistency, imprecision, risk of bias in the included studies, and risk of reporting biases.

Introduction

Problem

- State the question or relation(s) under investigation, including
  - historical background, including previous syntheses and meta-analyses related to the topic
  - theoretical, policy, and/or practical issues related to the question or relation(s) of interest
  - populations and settings to which the question or relation(s) is relevant
  - rationale for (a) the choice of study designs, (b) the selection and coding of outcomes, and (c) the selection and coding of potential moderators or mediators of results
  - psychometric characteristics of outcome measures and other variables

Objectives

- State the hypotheses examined, indicating which were prespecified, including
  - question in terms of relevant participant characteristics (including animal populations), independent variables (experimental manipulations, treatments, or interventions), ruling out of possible confounding variables, dependent variables (outcomes, criterion), and other features of study designs
  - method(s) of synthesis and, if meta-analysis was used, the specific methods used to integrate studies (e.g., effect-size metric, averaging method, the model used in homogeneity analysis)

Protocol

- List where the full protocol can be found (e.g., a supplement), or state that there was no protocol. State that the full protocol was published (or archived in a public registry) or that it was not published before the review was conducted.

Method

Inclusion and Exclusion Criteria

- Describe the criteria for selecting studies, including
  - independent variables (e.g., experimental manipulations, types of treatments or interventions, or predictor variables)
  - dependent variable (e.g., outcomes, in syntheses of clinical research including both potential benefits and potential adverse effects)
  - eligible study designs (e.g., methods of sampling or treatment assignment)
  - handling of multiple reports about the same study or sample, describing which are primary, and handling of multiple measures using the same participants
  - restrictions on study inclusion (e.g., by study age, language, location, or report type)

Inclusion and Exclusion Criteria (*continued*)

- changes to the prespecified inclusion and exclusion criteria, and when these changes were made
- handling of reports that did not contain sufficient information to judge eligibility (e.g., lacking information about study design) and reports that did not include sufficient information for analysis (e.g., did not report numerical data about those outcomes)

Information Sources

- Describe all information sources:
  - search strategies of electronic searches, such that they could be repeated (e.g., include the search terms used, Boolean connectors, fields searched, explosion of terms)
  - databases searched (e.g., PsycINFO, ClinicalTrials.gov), including dates of coverage (i.e., earliest and latest records included in the search), and software and search platforms used
  - names of specific journals that were searched and the volumes checked
  - explanation of rationale for choosing reference lists if examined (e.g., other relevant articles, previous research syntheses)
  - documents for which forward (citation) searches were conducted, stating why these documents were chosen
  - number of researchers contacted if study authors or individual researchers were contacted to find studies or to obtain more information about included studies, as well as criteria for making contact (e.g., previous relevant publications) and response rate
  - dates of contact if other direct contact searches were conducted such as contacting corporate sponsors or mailings to distribution lists
  - search strategies in addition to those above and the results of those searches

Study Selection

- Describe the process for deciding which studies would be included in the syntheses and/or included in the meta-analysis, including
  - document elements (e.g., title, abstract, full text) used to make decisions about inclusion or exclusion from the synthesis at each step of the screening process
  - qualifications (e.g., training, educational or professional status) of those who conducted each step in the study selection process, stating whether each step was conducted by a single person or in duplicate as well as an explanation of how reliability was assessed if one screener was used and how disagreements were resolved if multiple screeners were used

Data Collection

- Describe methods of extracting data from reports, including
  - variables for which data were sought and the variable categories
  - qualifications of those who conducted each step in the data extraction process, stating whether each step was conducted by a single person or in duplicate and an explanation of how reliability was assessed if one screener was used and how disagreements were resolved if multiple screeners were used as well as whether data coding forms, instructions for completion, and the data (including metadata) are available, stating where they can be found (e.g., public registry, supplemental materials)

Methods for Assessing Risk to Internal Validity

- Describe any methods used to assess risk to internal validity in individual study results, including
  - risks assessed and criteria for concluding risk exists or does not exist
  - methods for including risk to internal validity in the decisions to synthesize the data and the interpretation of results

Summary Measures

- Describe the statistical methods for calculating effect sizes, including the metric(s) (e.g., correlation coefficients, differences in means, risk ratios) and formula(s) used to calculate effect sizes.

Methods of Synthesis

- Describe narrative and statistical methods used to compare studies. If a meta-analysis was conducted, describe the methods used to combine effects across studies and the model used to estimate the heterogeneity of the effects sizes (e.g., a fixed-effect, random-effects model robust variance estimation), including
  - rationale for the method of synthesis
  - methods for weighting study results
  - methods to estimate imprecision (e.g., confidence or credibility intervals) both within and between studies
  - description of all transformations or corrections (e.g., to account for small samples or unequal group numbers) and adjustments (e.g., for clustering, missing data, measurement artifacts, or construct-level relationships) made to the data and justification for those
  - additional analyses (e.g., subgroup analyses, meta-regression), including whether each analysis was prespecified or post hoc
  - selection of prior distributions and assessment of model fit if Bayesian analyses were conducted
  - same and version number of computer programs used for the analysis
  - statistical code and where it can be found (e.g., a supplement)

Publication Bias and Selective Reporting

- Address the adequacy of methods used (e.g., contacting authors for unreported outcomes to identify unpublished studies and unreported data). Describe any statistical methods used to test for publication bias and selective reporting or address the potential limitations of the synthesis's results if no such methods were used.

Results

Study Selection

- Describe the selection of studies, ideally with a flowchart, including
  - number of citations assessed for eligibility
  - number of citations and number of unique studies included in the syntheses
  - reasons for excluding studies at each stage of screening
  - table with complete citations for studies that met many but not all inclusion criteria with reasons for exclusion (e.g., effect size was not calculable)

Study Characteristics

- Summarize the characteristics of included studies. Provide a table showing, for each included study, the principle variables for which data were sought, including
  - characteristics of the independent and outcome or dependent variables and main moderator variables
  - important characteristics of participants (e.g., age, sex, ethnicity)
  - important contextual variables (e.g., setting, date)
  - study design (e.g., methods of sampling or treatment assignment)
  - report where the full data set is available (e.g., from the authors, supplemental materials, registry)

Results of Individual Studies

- Report the results for each study or comparison (e.g., the effect size with confidence intervals for each independent variable). If possible, present this information in a figure (e.g., forest plot).

Synthesis of Results

- Report a synthesis (e.g., meta-analysis) for each study result (e.g., weighted average effect sizes, confidence intervals, estimates of heterogeneity of results).

Assessment of Internal Validity of Individual Studies

- Describe risks of bias different design features might introduce into the synthesis results.

Publication and Reporting Bias

- Describe the risk of bias across studies, including
  - a statement about whether (a) unpublished studies and unreported data or (b) only published data were included in the synthesis, and the rationale if only published data were used
  - assessments of the impact of publication bias (e.g., modeling of data censoring, trim-and-fill analysis)
  - results of any statistical analyses looking for selective reporting of results within studies

Adverse and Harmful Effects

- Report any adverse or harmful effects identified in individual studies.

Discussion

Summary of the Evidence

- Summarize the main findings, including
  - main results of the synthesis, including all results of prespecified analyses
  - overall quality of the evidence
  - strengths and limitations (e.g., inconsistency, imprecision, risk of bias, and publication bias or selective outcome reporting) of findings
  - alternative explanations for observed results (e.g., confounding, statistical power)
  - similarities and differences with previous syntheses

Generalizability

- Describe the generalizability (external validity) of conclusions, including implications for related populations, intervention variations, and dependent (outcome) variables.

Implications

- Interpret the results in light of previous evidence.
- Address the implications for further research, theory, policy, and/or practice.