Critical Appraisal Resources

Background to Critically Appraised Evidence

Critical appraisal is a process within the evidence-based medicine model that involves a systematic evaluation of research to determine its quality. The critical appraisal of evidence gives readers the opportunity to identify the risk of bias in a selected study and apply a systematic analysis to ensure that biases have not influenced the research results in any meaningful way.

Critical appraisal also provides readers with the opportunity to evaluate results of a study for their applicability in other, and potentially more relevant, settings.

Tools for Reviewers

After screening, reviewers can use the following tools to assess the risk of bias and other quality-related factors for studies that will be included in the systematic review.

- **CASP (Critical Appraisal Skills Programme)** - Tools and checklists for the critical appraisal of systematic reviews, randomized controlled trials, diagnostic test studies, economic evaluation studies, qualitative research, case control studies, and cohort studies.
- **Centre for Evidence-Based Medicine (Toronto)** - Critical appraisal worksheets for systematic reviews as well as diagnosis, harm, prognosis, and therapy studies.
- **Centre for Evidence-Based Medicine (UK)** - Critical appraisal worksheets for systematic reviews, diagnosis studies, prognosis research, and therapy or randomized controlled trial studies.
- **Cochrane Handbook for Systematic Reviews of Interventions** - A guide to conducting Cochrane systematic reviews. See *Chapter 8: Assessing risk of bias in included studies*.
- **Jadad Scale** - Simple, yet widely used quality assessment questionnaire for randomized controlled trials.
- **Joanna Briggs Institute Critical Appraisal Tools** - Checklists for reviewing randomized controlled trials, systematic reviews, case control, case reports, diagnostic test accuracy, qualitative, and many more study types.
- **NOS (The Newcastle-Ottawa Scale)** - A quality assessment tool for assessing nonrandomized studies.
- **PEDro Scale** - A checklist that rates the quality and interpretability of clinical trials.
- **Risk of bias assessment tool for non-randomised studies for interventions** - A Cochrane risk of bias assessment tool (ACROBAT-NRSI) developed through collaborative research between the Bias Methods Group and the Non-Randomised Studies Group.
Instruments and Reporting Guidelines for Authors

Reporting guidelines are tools to identify methodological weaknesses and promote transparency. They are not intended to dictate the design of a study or the conduct of investigators. These guidelines offer recommended frameworks for investigators to consider as they report their research.

The following reporting guidelines are organized by study type. Many of these initiatives are ongoing processes and periodically updated.

Randomized Controlled Trials

- **CONSORT (Consolidated Standards of Reporting Trials)** - Guidelines for the reporting of randomized controlled trials.
- **SPIRIT Statement** - Recommendation for reporting clinical trials.
- **TiDieR (Template for Intervention Description and replication)** - Checklist and guide for reporting interventions.

Observational Studies

- **MOOSE (Meta-analysis of Observational Studies in Epidemiology)** - Guidelines for reporting meta-analyses of observational studies in epidemiology. PMID: 10789670.
- **STROBE (STrengthening the Reporting of Observational Studies in Epidemiology)** - Guidelines for reporting various types of observational (cohort, case-control, and cross-sectional) studies in epidemiology.
- **TREND Statement (Transparent Reporting of Evaluations with Nonrandomized Designs)** - This set of guidelines from the CDC contains items for reporting nonrandomized control trials.

Systematic Reviews

- **PRISMA Statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)** - Formerly QUOROM, PRISMA offers guidelines for the reporting of systematic reviews and meta-analyses.
- **Cochrane Risk of Bias Tool** - The Cochrane Collaboration’s domain-based evaluation tool for assessing the methodological quality of systematic reviews.

Quality Improvement Studies

- **SQUIRE Guidelines (Standards for QUality Improvement Reporting Excellence)** - Guidelines for quality improvement reporting.
- **CARE (CAse REports) Statement** - Guidelines for the reporting of case reports.

Diagnostic/Prognostic Studies

- **STARD (Standards for Reporting Diagnostic Accuracy)** - Checklist for reporting the quality of diagnostic accuracy studies.

Qualitative Research

- **SRQR (Standards for Reporting Qualitative Research)** - Recommends a list of 21 items for reporting qualitative research.
- **COREQ (Consolidated Criteria for Reporting Qualitative Research)** - Offers a 32-item checklist for interviews and focus groups.

Find more reporting guidelines

- **EQUATOR network** - Access to over 300 reporting guidelines.
- **SIGN Critical Appraisal: Notes and Checklist** - Appraisal tools for systematic reviews and meta-analyses, randomized controlled trials, as well as cohort, case-control, diagnostic, and economic studies from the Scottish Intercollegiate Guidelines Network.

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### Critically Appraised Summary Resources

The following links connect you to critical appraisal tools for resources that summarize multiple studies.

#### Clinical Practice Guidelines Appraisal Tool


#### Additional Tools for Synthesized Reports

- **the NNT** - Brief summaries of NNT “Number-Needed-to-Treat” based on critical appraisal of systematic reviews related to therapy or diagnosis studies.
- **ACP Journal Club** - Summaries of evidence from over 130 clinical journals. Published by the American College of Physicians-American Society of Internal Medicine.
- **EvidenceUpdates** - Access to articles from over 110 clinical journals that have been critically appraised by a panel of practicing physicians. Includes a searchable database and email alerts option. From BMJ Publishing Group and McMaster University's Health Information Research Unit.

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### Find it at Galter

- **Basic statistics and epidemiology : a practical guide / Anthony Stewart.**
- **Biostatistics and Epidemiology : A Primer for Health and Biomedical Professionals / by Sylvia Wassertheil-Smoller, Jordan Smoller.**
- **Interpreting statistical findings : a guide for health professionals and students / Jan Walker and Palo Almond.**
- **Quantitative methods for health research : a practical interactive guide to epidemiology and statistics / Nigel Bruce, Daniel Pope and Debbi Stanistreet.**
- **Statistical methods in epidemiologic research / Ray M. Merrill.**
- **Statistics in medicine / R. H. Riffenburgh.**
- **Studying a study and testing a test : how to read the medical evidence / Richard K. Riegelman.**

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### Additional Resources

- **Evidence-Based Practice: Appraise** - Appraisal tools provided by Duke University Medical Center Library and Archives.
- **Critical Appraisal Tools** - Links to critically appraisal tools provided by the University of South Australia.
- **Users' Guides to the Medical Literature** - Detailed information about medical literature in evidence-based medicine. Provided by JAMAevidence.
- **Oxford Centre for Evidence-based Medicine Levels of Evidence** - Grades the strength of evidence.

### Online Calculators

- [EBM and Decision Tools by Alan Schwartz (UIC)](https://www.evidence.org/calculator)
- [MedCalc Free statistical calculators](http://www.medcalc.org/
- [MUSM Libraries: Calculators](http://muser.library.wustl.edu/calculator)
- [Risk Reduction Calculator](http://www.riskreductioncalculator.com)
- [Therapy 2 by 2 Table Calculator (JAMAevidence)](http://www.jamaevidence.com/calculator)

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