CRITICALLY APPRAISING CRITICAL APPRAISAL

PenSR Discussion Forum
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and with insights from:
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What is CA?

• Critical appraisal is the process of carefully and systematically examining research to judge its trustworthiness, and its value and relevance in a particular context. (Burls 2009)

• Critical appraisal looks at the way a study is conducted and examines factors such as internal validity, generalizability and relevance (CEBM website, Aug 2015)

• Critical appraisal is a systematic process used to identify the strengths and weaknesses of a research article in order to assess the usefulness and validity of research findings (Young & Solomon, 2009)
Why do CA?

• Systematic reviews aim to collate and synthesise all studies that meet pre-specified eligibility criteria using methods that attempt to minimise bias

• To obtain reliable conclusions, review authors must carefully consider the potential limitations of the included studies

• Empirical evidence of bias in RCTs (esp. subjective outcomes)
  • Random-sequence generation
  • Allocation concealment
  • Double-blinding

(The notion of study “quality” is not well defined but relates to the extent to which its design, conduct, analysis, and presentation were appropriate to answer its research question)
How?

• Little consensus regarding the 'gold standard' tool for medical evidence and little consensus regarding the most appropriate items that should be contained within critical appraisal tools

• Agency for Health Research Quality (2002) identified 93 critical appraisal tools for quantitative studies alone

• CA tools can be design specific or more generic: e.g.
  - Cochrane ROB (RCTs)
  - Wallace (Qual)
  - AMSTAR (SRs)
  - CASP (RCT, CT, Cohort, QUAL etc)
  - McMaster Critical Review (generic QUANT)
  - EPHPP (generic QUANT) see: tool

• Movement away from ranking

• Useful websites: CASP, CEBM, JBI, EPHPP, Cochrane
For example.....

- CASP website
- CEBM
Issues

• choosing your CA tool
• adapting your CA tool
• confusion between reporting guidelines and CA
• CA of outcome or whole study (or review)

• How to incorporate your CA findings?
Possible approaches from Cochrane, NHS CRD or JBI

- **Restrict** review to high quality/low risk of bias studies
  - preferably *a priori* [Cochrane, NHS CRD, JBI*]
- **Stratify** by amount of bias/quality [Cochrane, NHS CRD]
- **Sensitivity analyses** including/excluding those at high risk or unclear risk of bias [Cochrane, NHS CRD]
  - Confusing for reader? [Cochrane]
- **Weighting** of studies in the MA
  - Methods not well developed [Cochrane]
  - Expert opinion
- **Narrative discussion** of risk of bias/quality
  - discouraged when studies of varying risk of bias [Cochrane]
- **Recommendations** for future research [Cochrane]
Katikireddi et al. paper

Assessment of CA in 59 SRs published in 14 high-ranked medical journals and a sample from the Cochrane library

- 6 presented no CA at all
- 37 standard tool, 10 adapted, 4 bespoke, 2 simple description
- 15/42 studies assessing multiple outcomes, appraised only one outcome
- 28/53 showed ranking of low/high bias
- of those prioritising studies based on bias, none reported the rationale for their decisions
- 20/59 did not use CA to inform findings
Some shared experiences …

- Lindsey – cochrane reviews
- Lou – technology appraisals
- Harriet – diagnostic reviews
- Darren – reviews of qualitative studies
- Others?
Further reading…

• Hopewell, S., Boutron, I., Altman, D.G., Ravaud, P. Incorporation of assessments of risk of bias of primary studies in systematic reviews of randomised trials: A cross-sectional study (2013) *BMJ Open*, 3 (8), art. no. e003342


