



Critical Appraisal



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Critical Appraisal

- What it is?

Systematically assessing literature to assess its (**trustworthiness**), **relevance**, **validity** and **applicability** to specific situations.

- What it isn't?

- Assessment of results only
- Based only on statistical analyses



Why is it necessary?

- It is an essential skill for clinicians to find and use research evidence reliably and efficiently for purpose of evidence-based medical practices and research

Reference:

http://www.medicines.ox.ac.uk/bandolier/painres/download/whatis/what_is_critical_appraisal.pdf



Why is it necessary?

- “we need reliable information about what might harm or help us when we make healthcare decisions. Research involves gathering data, then collating and analyzing it to produce meaningful information. **However, not all research is good quality and many studies are biased and their results untrue.** This can lead us to draw false conclusions.”

Reference:

http://www.medicinesox.ac.uk/bandolier/painres/download/whatis/what_is_critical_appraisal.pdf



Why is it necessary?

- Studies which don't report their methods fully **overstate** the **benefits** of treatments by around 25%

- *Khan et al. Arch Intern med, 1996; Maher et al, Lancet 1998.*

- Studies funded by a pharmaceutical company were found to be 4 times as likely to give results that were **favourable to the company** than independent studies

- *Lexchin et al, BMJ, 2003*

Source: Sarah Lawson, November 2010. Critical appraisal of quantitative research



Why is it necessary?

- “If healthcare professionals and patients are going to make the best decisions they need to be able to:
 - Decide which studies are relevant;
 - Decide whether studies have been undertaken in a way that makes their findings reliable;
 - Make sense of the results; and
 - Know what these results mean in the context of the decision they are making.”

Reference:

http://www.medicines.mcgill.ca/bandolier/painres/download/whatis/what_is_critical_appraisal.pdf



What you need in order to do critical appraisals

- Know the subject and current information
- Knowledge on study designs
 - Different study designs are used for different research questions
 - Different study designs have different sources of biases
- Knowledge on statistics
 - There are different methods of presenting the same data



What you need in order to do critical appraisals of literature

- Generally literature in peer-reviewed journals have been appraised by peers.
- Have a clear intention or purpose, such as the title or objectives of planned study
- Use available appraisal tools as a start; tools only help to organize the appraisal process but final decision is still with the investigator



How to appraise?

- Based on types of studies: ie: systematic review, RCT
- Is the study valid?[**validity**]
 - Study question relevant, ie: equipoise? Study design and methodology appropriate? bias? Is statistical analyses correct? Data justify conclusions?
- What are the results?[**reliability**]
 - Does the result show a statistically better outcome
- Are the results useful? [**applicability**]
 - Valid to your study population? generalizable to local setting?

How to appraise?

PICO tool: Population, Intervention, Comparison, Outcome

Clinical
problem



Define the
question



Search



Evaluate



Decide



Appraise



Critical appraisal



TEN QUESTIONS TO ASK WHEN CRITICALLY APPRAISING A RESEARCH ARTICLE

- Is the study question relevant?
- Does the study add anything new?
- What type of research question is being asked?
- Was the study design appropriate for the research question?
- Did the study methods address the most important potential sources of bias?
- Was the study performed according to the original protocol?
- Does the study test a stated hypothesis?
- Were the statistical analyses performed correctly?
- Do the data justify the conclusions?
- Are there any conflicts of interest?

Ref: JM Young & MJ Solomon, Nature Clinical Practice Gastroenterology & Hepatology (2009) 6, 82-91



Starting critical appraisals

- Use available tools as a start
- E.g.
 - Centre for Evidence-Based-Medicine critical appraisal tools
 - <http://www.cebm.net/critical-appraisal/>
 - <http://www.sign.ac.uk/methodology/checklists.html>
 - <http://www.casp-uk.net/#!casp-tools-checklists/c18f8>



Thank you

Any Questions?