

**From research to practice: Postgraduate
training in reproductive health/chronic
disease**

CRITICAL APPRAISAL

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What is critical appraisal?

The fair assessment of research reports
in terms of

- their contribution to scientific knowledge
- the validity of their results
- the extent of the generalisability of their results

Why is critical appraisal important?

Review of more than 4200 published medical reports in about 30 journals (many of them prestigious and well-known e.g. BMJ, JAMA, NEJM, Lancet) in terms of scientific adequacy of study designs, data collection and statistical methods (Williamson, 1986)

- only **20%** of 4235 research reports met the validity criteria
- **~80%** of those **inadequately designed** and analysed had reported **positive findings** whereas **~25%** of those with adequate designs reported positive results

Why is critical appraisal important?

- evaluates what the reported research has and has not shown
- generates healthy scepticism for biomedical knowledge - being in print does not mean that research is good or useful
- helps transfer of relevant knowledge into practice, by converting unrefined mass of published research into usable format

General considerations

When interpreting any published research article, it is important to assess

- statistical power
- clinical importance
- confidence intervals for main results
- methodological quality of design, conduct, analysis
- appropriateness of conclusions drawn

Basic questions

- Are the results valid?
- What are the results?
- Can I apply the results to my practice?

Standard format of a research paper

- Title
- Abstract
- Introduction
- Methods
- Results
- Discussion

Abstract

- Structured abstract
- Is the study properly designed and analysed?
- Are the results important and worth knowing about?

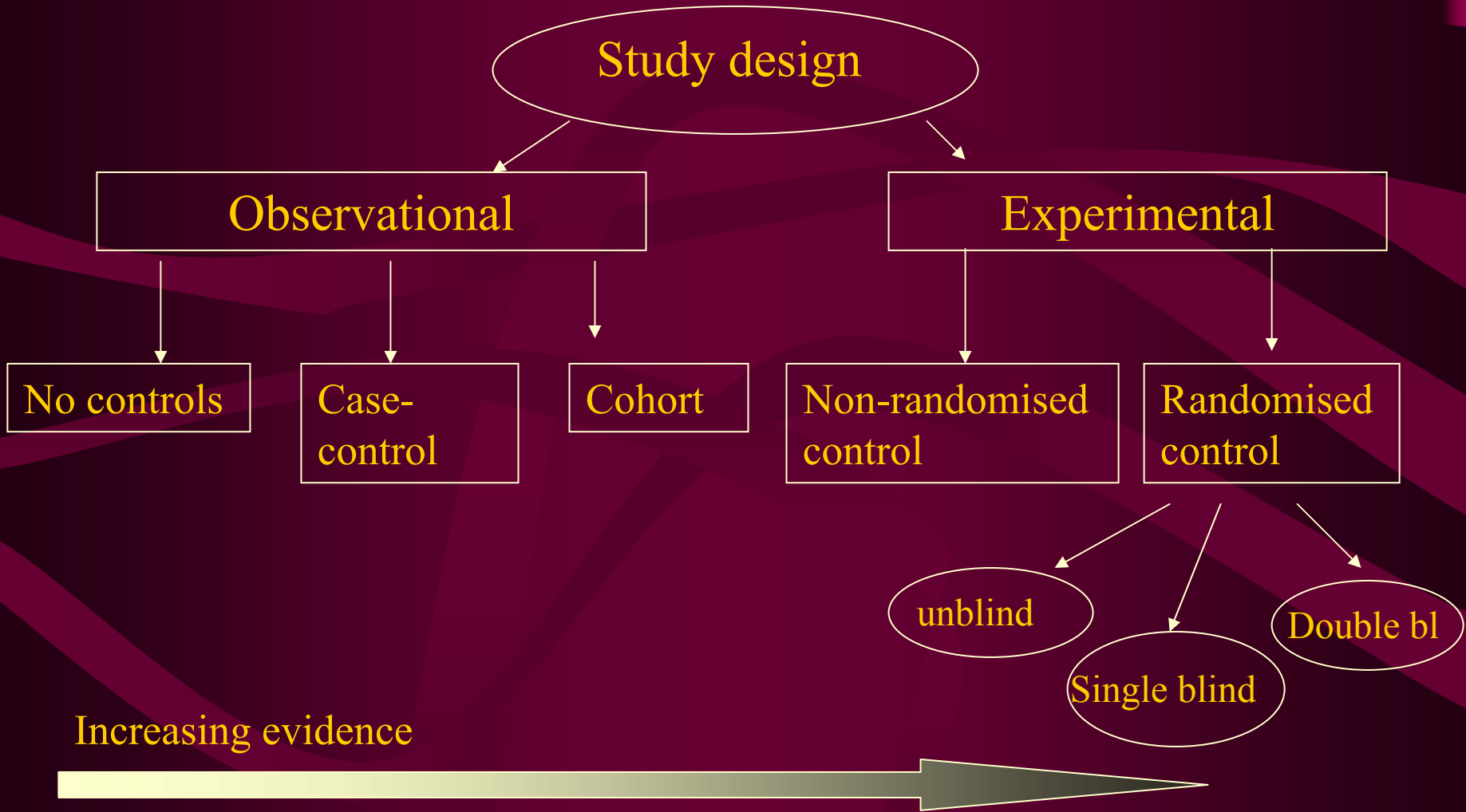
Introduction

- Is the research question clearly described?
- Is the study important to answer this question?
- Is the relevant background described?
 - what is already known and not-known on the topic?
 - how this study differ from the previous similar studies?
- Is the literature search adequate?

Methods

- Is the study design appropriate for the question studied?

Levels of evidence for cause and effect relationship



Methods

- How were the participants selected?
- Justification of sample size?
- Is randomisation/blinding appropriate?
- Prospective or retrospective data collection?
- Any effort to ensure good response rate or minimise the amount of missing data?
- Are the outcomes of interest are defined and measured adequately?
- Are the statistical methods appropriate?
- Ethical approval?

Results

- Are the characteristics of the participants described? Are they representative of the population to which findings are applied?
- Are the analyses appropriate?
- Any data dredging – many statistical tests/comparisons?
- Are main results are presented with confidence intervals?

Discussion

- Limitations/biases of the study
- Clinical vs statistical significance
- Are the conclusions appropriate?
- Are the conclusions based on data – do the authors extrapolate beyond data?
- Implications for practice/future research?

References

- Are the citations presented in a standard format?

Authors' affiliations

- Is the list of contributors reasonable – twenty authors for a small study?
- Conflict of interest – any financial/administrative relationships with institutions related to the outcome of interest

Summary

- Critical appraisal of research reports is vital to be able to interpret properly and decide to use the results
- Basic understanding of study designs and statistical principles are needed for critical appraisal of research