Evidence based-practice (EBP)

“Critiquing Quantitative Literature - level one”

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Reference notes:

**Title:** “Evidenced based-practice (EBP): Critiquing Quantitative Literature - level one”

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**Target Audience:**

Undergraduate students/ [Introductory level](https://www.thesis-database.com)
Introduction

• Why critique?

• Short-listed articles

• Types of Study
  - RCTs
  - Cohort Studies
  - Case controlled Studies
  - Cross-sectional Studies

• Reading patterns

• Tips & Techniques
Introduction

• Initial critiques

• Appraisal tools

• Key terms
  - Sample size
  - Blinding
  - Validity & Reliability

• Q&A
Why Critique?

- To assess the quality
- To ensure its trustworthy
- We all have an ethical responsibility
- As a pt would you want a practitioner to act on evidence that was misleading or inaccurate?
Your short-listed articles

- Every paper should be critiqued
- What type(s) of study do you have?
- How do they rank according to the hierarchy of evidence?
Main “types” of study

- RCT
- Cohort study
- Case-control
Randomized Controlled Trials (RCTs)

- Often considered as the Gold Standard (in primary research)

- **Introduce a treatment / Intervention**

- Very strong methodologies

- Aim to reduce bias (through randomisation + blinding)

- Very expensive to conduct

- can take many years to complete
Cohort Controlled /Cohort Studies

- Observational
- Prospective
- Follow group(s) of pts who are already exposed/already taking a particular treatment OR Intervention
- To see whether something (e.g. a disease) is more likely to occur in that particular group (compared to a group who is not-exposed)
- e.g. is smoking more likely to cause lung Ca?
Case Controlled Studies

- Observational
- Retrospective

- Looks back on group(s) of pts who have a particular disease / condition
  and compares them with others who do not have the condition

- To try and establish what has caused the disease / condition
Cross-Sectional Design Studies

- Data collected at **one** time point
- Looks at a defined population (e.g. pts with suspected Ca)
- Data can be collected via surveys/ questionnaires (e.g. Feedback form after an A&E attendance)
- Can be used to compare **diagnostic tests**
- Cross-sectional studies that do this can also be called “blind comparison to gold standard studies”
- Pt has test X, test Y and Gold Standard test (Sensitivity + Specificity then compared)
Your short-listed articles

- Do **results differ** between papers?
- If yes, **why**?
- Dig deeper...
Recommended reading pattern

Start with the **Abstract** / Introduction

- Methodology

- Main Body (Discussion)

- Results & Conclusions
Tips & techniques

• Research papers are often long (Normally between 1500-3500 words)

• Could break it down by highlight keywords + statements

• Write notes / bullet points / tables

• Group/ order the articles
As you read through, ask yourself: “Is this any good?”

• Do they ask a clear, focused answerable Q? (PICO)
  (If it is impossible to answer the Q, then the research could be worthless)

• Any obvious flaws in the research?
  (Flaws or biases that can impact or even change the outcome? Can we really trust the results?)

• If yes, consider excluding from your review!
  (record + justify any exclusions – This can be placed in your methodology or appendix)
Appraisal tools

- Could use an appraisal tool (Framework/checklist/or guide)
- ✔ 1,000's+ available
- ✔ Most are free
- ✔ Easy to follow (Often with pre-set questions)
- ✔ Allows you to apply the same critique to every paper

(Allows a systematic approach + \( \downarrow \) Bias)

- ✗ Deciding which tool to choose (if any) is difficult
- ✗ Must ensure it is appropriate (Is it valid? does it do its job?)
- ✗ Can be very time consuming to apply to every paper
Examples

- **CASP** (Critical Appraisal Skills Programme)
  Has a separate tool for:
  Reviews, Cohort Studies, Qualitative Research, Economic Evaluations
  [http://www.casp-uk.net/#!checklists/cb36](http://www.casp-uk.net/#!checklists/cb36)

  Comment: Excellent/ v.detailed

- **AGREE** (Appraisal of Guidelines for Research & Evaluation)
  A tool to appraise:
  Guidelines

  Comment: Excellent/ v.detailed
Examples

• **CEBM** (Centre for evidence-based medicine/uni of Ox)
  Has a separate tool for:
  Reviews, Diagnostics, Prognosis, RCTs
  http://www.cebm.net/critical-appraisal/

  **Comment:** Good

• **Again! others are available — including generic ones!**
  Find via search engines / Article databases / University websites / Books /
  Key Medical, Nursing and Allied Health websites /

  **Comment:** /?What criteria/frameworks have other published reviews/
  *systematic reviews* used?
Key terms to look out for in primary studies
(In diagnostic test studies)

- Sample size
- Randomisation
- Blinding
- Valid form of measurement
- Reliable form of measurement
- Bias
Sample Size

- Participants
- Likely to represent the wider population + reflect reality
- How did the author determine their sample size?

Randomisation (↓ Bias)

- Were participants recruited randomly? (Into group A or group B etc.)
- Images randomly assigned to the Radiologist? (or could they choose?)
## Blinding

- Minimises bias. – no blinding? Could potentially skew results
- **Broadly** speaking there 3 types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>Subject(s) unaware of what (treatment/intervention) group they belong to <strong>OR</strong> Researcher(s) unaware of what (treatment/intervention) group the subject(s) belong to</td>
</tr>
<tr>
<td>Double</td>
<td>Subject(s) unaware of what (treatment/intervention) group they belong to <strong>AND</strong> Researcher(s) unaware of what (treatment/intervention) group the subject(s) belong to</td>
</tr>
<tr>
<td>Triple</td>
<td>Subject(s) unaware of what (treatment/intervention) group they belong to <strong>AND</strong> Researcher(s) unaware of what (treatment/intervention) group the subject(s) belong to <strong>AND</strong> Statistician(s) unaware of what (treatment/intervention) group the subject(s) belong to analysing results</td>
</tr>
</tbody>
</table>
Measurement (Validity)

- Does it measure what it is suppose to measure?
- Is it accurate?

Measurement (Reliability)

- Does it measure consistently over time?
- Do we get the same measurements/results if we were to repeat?
Question

“I live in the UK. My watch is always 1 hour and 3 minutes fast”

Q: As a form of measurement

Is it reliable?
Is it valid?
Question

“I live in the UK. My watch is always 1 hour and 3 minutes fast”

ANS: My Watch:

Highly reliable
(Always / Consistently fast – by 1hr 9 min)

Demonstrates Poor validity
(Does not accurately measure what it is suppose to measure. In this case GMT)
Measuring

• What is measuring your Outcome?
  (Think back to your PICO)

• (P = Pts with Colorectal cancer)
  (I = CT
  (C = MRI
  (O = Sensitivity

• Measurer = Image Interpreter
# The Reader (Human)

- Who are they? Are they suitable for the study?

<table>
<thead>
<tr>
<th>Profession:</th>
<th>(Radiologist? Orthopod? Radiographer? AE Dr?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience:</td>
<td>(In years?, Specialism?, Rank?: Registrar, Consultant?)</td>
</tr>
<tr>
<td>Access:</td>
<td>(Axials only? Sagitals? Coronals? 3Ds?)</td>
</tr>
<tr>
<td>Other:</td>
<td>Do they use CAD? When do they use CAD?</td>
</tr>
<tr>
<td>Blinding:</td>
<td>Have they been blinded? What to?</td>
</tr>
<tr>
<td>Number:</td>
<td>Is there &gt;1 reader? Do they all look images?</td>
</tr>
<tr>
<td>Disagreement:</td>
<td>What do they do? How do they achieve consensus?</td>
</tr>
</tbody>
</table>
Any Questions?