Notes - CHML1001 Evidence Informed Health Practice

Topic 1 – What, Why & How of Research

1. **Key Terms:**
    - **Mean**: the average value (sum all values ÷ frequency of all values)
    - **Median**: the middle/ half-way value of all data distributed
    - **Mode**: the value that occurs most frequently
    - **Validity**: how well a measurement measures what it claims to
    - **Reliability**: the consistency of a measurement each time it is recorded
    - **Provenance of the Evidence**: the origin/ source of evidence
2. **Evidence-Based Practice (EBP):** A practice that is supported by scientific evidence, clinical expertise and client values.
    - **Scientific evidence**: using the best available research
    - **Clinical expertise**: consideration of personal/professional experiences to guide patients
    - **Client values**: considering client's preferences

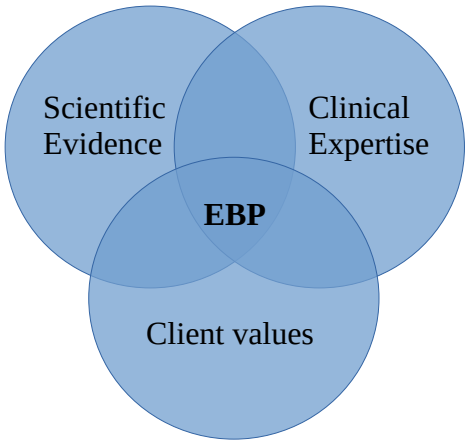

Figure 1.1: Evidence-Based Practice Triad Approach

Five steps to emerging science of Evidence-Based Practice (EBP):

1. **Ask**: convert information into answerable questions;
2. **Acquire**: track down the best available evidence to answer these questions;
3. **Appraise**: assess validity and usefulness of evidence critically;
4. **Apply**: implement results of the appraisal into clinical practice;
5. **Evaluate**: evaluate individual performance

3. **What is Evidence?**: evidence is the systematic inquiry of research.

    Considerations need to be made when finding evidence

    1. Where did you get the information from?
        - Source: Peer-reviewed Journal vs. news-article?
    2. Did you research options available to best suit your needs?
        - What were the main findings? What were the limitations of the study?
    3. How confident were you that you could trust this information? Why?
        - Credibility of source? Study design, sampling and methods?

Summary of Topic 1 – What, Why & How of Research

- The purpose of evidence-based practice is to assist health professionals in clinical decision making. The best evidence-based practice involves integration of best research evidence, clinical expertise and accommodating client values and circumstances.
    - Evidence-based practice is NOT just following guidelines provided by a practice.

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Topic 2 – Levels of Evidence

1. **Searching for evidence:**
   - **Primary**: literature that reports results from a single study.
   - **Secondary**: synthesized findings from numerous studies.
     - Meta-analysis/ Systematic review: a large scale review based on multiple studies.
   - **Experimental**: research that involves the manipulation of a interdependent variable to determine the effect on the dependent variable.
   - **Observational**: research that simply observes a correlational relationship between two (or more) variables.
   - **Quantitative**: evidence recorded numerically (i.e., numbers, percentages, values).
   - **Qualitative**: evidence recorded in greater detail (i.e., words, meanings, emotions).
2. **Levels of Evidence**: aims to assist in finding the 'best' available research and understanding the levels of bias in study designs.

   Key terms:
   - **Independent variable**: the variable that you manipulate (known as intervention).
   - **Dependent variable**: the variable that you measure (known as outcome).
   - **Con-founding variable**: anything other than the Independent variable that may have an impact on the Dependent variable.
   - **Bias**: something that has the potential to influence the results of study.
3. **Levels of Evidence: I-V**

I	Systematic Review: results of numerous randomized control trials
II	Randomized Control Trial: results of intervention's effect on an outcome
III-1	Pseudo-Randomized Control Trial: same as above; however, trial is less randomized
III-2	Cohort Study: a group that is being followed over time
III-3	Case-control Study: analysis backwards by determining the intervention by outcome
IV	Cross Sectional: a group study completed at one point in time
V	Anecdotal: a hypothesis generating and subjective view held by an individual.

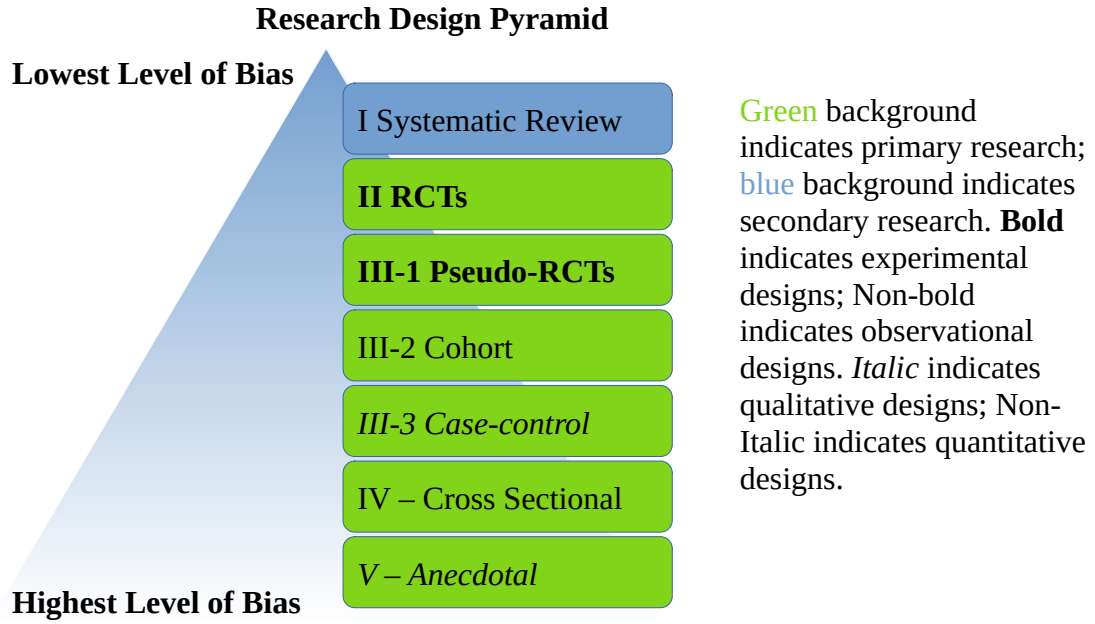

Figure 2.1: EIHP Levels of Evidence Pyramid – adapted from NHMRC

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4. **Bias**: something that has the potential to influence the results of the study.
   Types of bias (*that effect intervention studies*):
   - Allocation bias: differences between the intervention and control group at the start of the experiment.
   - Detection bias: differences between how the intervention and control groups are measured.
   - Performance bias: events other than the intended treatment happening during the experiment.
   - Attrition bias: when participants unexpectedly leave the study during the experiment.
   - Measurement bias: when outcomes of the experiment are measured incorrectly.
5. **Observational Level Designs**: little (to no) manipulation to variables as they are observed.
   - Cohort study: a group being followed over time.
     - Prospective: following over-time; Retrospective: following backwards in time.
     - Can't manipulate variables; useful for determining risk, prognosis and likely to result in multiple different outcomes.
   - Case-control: retrospective viewing of dependent variable.
     - Suitable for rare outcomes (as you've found the people who have developed the outcome already.
     - Used to assess multiple exposures; however, cannot determine causation.
   - Cross-sectional: group study completed at that point in time (i.e., survey/ questionnaire).
     - Relies on self report (subject to report bias, recall bias and social desirability).
     - Only valid at that point in time (meaning, when published, may not be accurate).
   - Correlational : investigates correlation between interdependent and dependent variables.
     - Useful to determine an indicative relationship.
     - Correlation does not equal causation.
   - Case-series: group of similar presenting cases (symptomology, diseases and exposure).
     - In-depth information with good internal validity.
     - Small sample limits external validity
   - Case study: in-depth study of one person, or disease.
     - Rich and in-depth information about one person, or disease.
     - When details are only applied to one person, results can't be generalized.
   - Anecdotal / Expert Opinion: hypothesis generating, also subjective.
6. **Systematic Review**: a synthesis of numerous studies combined.
   1. Research question: what is being research?
   2. Define terms: Put together a search strategy (keywords)
   3. Search: check data-bases and reference lists
   4. Assess: rank in terms of how well results meet the criteria and rate them accordingly
   5. Summarize & Report findings: write up findings, results, followed by a discussion.

<u>Summary of Topic 2 – Levels of Evidence</u>

- Levels of evidence refers to what degree on the study design information can be trusted;
  - Primary research reviews the effect of an intervention on an outcome
  - Secondary research reviews synthesized findings of numerous primary research.
  - Experimental research involves the manipulation of interdependent variables.
  - Observational research involves observing with no manipulation to variables.
- The highest level of research is a Systematic Review (or Meta-analysis) which contains the lowest level of bias; whereas, the lowest level of research is Anecdotal which contains the highest level of research
  - Bias refers to the potential for something to influence the results of a study.