Exercises

# Chapter 6: Assessing the evidence base

## Exercise 6-1: Study selection

Now, revisit your **inclusion and exclusion criteria** from Chapter 5 and write them in the grid provided. Keep this grid to hand whilst you go through your study selection process.

|  |  |
| --- | --- |
| **Tool for focusing your question – PICO, SPICE, etc.** | |
| **Inclusion Criteria** | **Exclusion Criteria** |
| **Population** | **Population** |
| **Intervention/Exposure/focus of Interest** | **Intervention/Exposure/focus of Interest** |
| **Comparator (if present)** | **Comparator (if present)** |
| **Outcome(s)** | **Outcome(s)** |
| **Context** | **Context** |
|  |  |

## Exercise 6-2: Assessing the evidence base for your review

Consider the types of review in Table 6.1. Think about what questions you might want to ask when assessing the evidence base for your review:

|  |
| --- |
| **Insert your response:** |
|  |
| Your review question: |
| * Which key questions do you need to ask for your review? |
| * What is the practical application of your questions? |

*Table 6-1: Assessing the evidence base in different types of reviews*

|  |  |  |  |
| --- | --- | --- | --- |
| *Type of review* | *Key questions to ask when assessing the evidence base* | *Practical application* | *Review example* |
| Scoping review | * Do any previous reviews exist? * How much evidence exists on my review question? * What type of evidence is available? | Identifies previous reviews on your topic area to avoid duplication.  If there is a significant volume of evidence, you might want to consider refining your scope. Too little evidence and you might want to broaden your question.  ‘Firms up’ review question by exploring what kind of evidence is out there. For example, if your review is limited to randomised controlled trials (RCTs) but your scoping search finds no trials, you may need to consider other types of research design. Similarly, if you have limited your review question to UK studies but found no UK studies in your scoping search, you may wish to widen to include research beyond the UK. It is particularly important to assess generalisability if looking at studies outside of the setting (context) of your review question. | *A scoping review of the association between rural medical education and rural practice location* (Farmer et al., 2015). |
| Mapping review | ● Where is evidence plentiful?  ● Where is evidence lacking (gaps)?  ● How can I describe the evidence?  ● Are there relationships or key themes occurring? | Focus for subsequent literature reviews  Key features of evidence base include study design, country of publication, populations or subgroups, nature of intervention or exposures analysed (are they similar or do they differ greatly)  Explores:  ● Directional effects (A affects B)  ● Whether studies are in agreement  ● Whether findings conflict | Maternity Care Services and Culture: A Systematic Global Mapping of Interventions (Coast et al., 2014). |
| Systematic review | ● How can I describe the evidence?  ● Are there relationships or key themes occurring?  ● How credible is the evidence?  ● How applicable is the evidence to my situation/scenario?  ● Where is evidence lacking (gaps)? | Key features might include study design, country of publication, populations or subgroups, nature of intervention or exposures analysed (are they similar or do they differ greatly?)  Directional (A affects B)  Studies in agreement  Conflicting studies  Quality of the study conduct and design: subgroup analyses  Generalizability of research  Areas for future research | Psychosocial Interventions for School Refusal with Primary and Secondary School Students: A Systematic Review (Maynard et al., 2015) |
| Qualitative systematic review | ● How can I describe the evidence?  ● What themes or constructs are present between or within individual studies?  ● What is the quality of the evidence? | Key features, e.g., perspectives, settings (are they similar or differ greatly?)  Interpretation of a phenomenon – broaden understanding  Does this mediate the findings? | Treatment non-adherence in pediatric long-term medical conditions: systematic review and synthesis of qualitative studies of caregivers’ views (Santer et al., 2014) |

## Exercise 6-3: When is an article worth reading?

Before introducing quality assessment in more detail, when you come across a research study in a journal, consider:

1. How do you decide whether an article is worth reading?

2. What makes an article believable?

## Exercise 6-4: Study scenario – Identifying sources of Bias

Can an information technology intervention improve primary schoolchildren’s performance in solving maths problems?

A teacher selects twenty primary school children to take part in this study as a reward for good behaviour. At the start of the study, each child completes a maths problems test consisting of 10 questions. Each child then completes a 1-hour online workbook in which they complete a series of maths problems in the form of fun games and exercises. The children then complete another maths problems test of 10 questions, and the number answered correctly is recorded. The teacher asks each child to recall how many they got correct in the maths test before the study started.

**1 What sources of bias can you see?**

Hint 1 – might the children selected to take part in the study differ in any way from those who did not take part?

Hint 2 – do you think the children could accurately (and truthfully!) recall their score for the test they took at the beginning of the study?

**2 Aside from the sources of bias in this study, what other factors might limit the credibility of the study findings?**

## Exercise 6-5: Quality assessment

In Table 6.13, three articles and their citations are presented for you to test out your quality assessment skills. Each of the three articles is open-access and therefore freely available online.

We have selected articles that report different study designs and different topics. Skills that you acquire from undertaking this exercise will transfer to assessing studies from other disciplines, including your own.

First, read the full article, then try undertaking a quality assessment using an appropriate checklist (suggested checklists are provided in Tables 6.8 and 6.11). Then look at the model answers (also on the book website) for each article based on the suggested checklists, to see if you’ve identified the key points. Try undertaking the exercise without looking at the corresponding model answers until you have completed your assessment and then look to see if you’ve identified the key points. Don’t worry if some of your judgements disagree with the sample answers. This can, and often does, happen within systematic review teams. This is why two reviewers make initial judgements, discuss discrepancies and, where agreement cannot be reached, a third reviewer acts as an adjudicator to reach a final, agreed judgement. You are likely to have identified points that our sample answers have overlooked.

### Quality assessment of an article

*Table 6‑8: Key quality assessment checklist resources – quantitative designs*

|  |  |
| --- | --- |
| *Study design checklists* | |
| Resource | Details |
| Systematic Reviews Toolbox (http://systematicreviewtools.com/) | Searchable online catalogue of tools to support systematic reviews. Focus on automated tools (software), but other tools (e.g., checklists) are also included. For quality assessment tools, select “Other Tools” in the “Advanced Search” function and “quality assessment” from the “Find Me” feature list. |
| Critical Appraisal Skills Programme (CASP) | Checklists for the following study designs:  Case-control studies  Clinical Prediction Rules  Cohort studies  Diagnostic test studies  Economic evaluation studies  Randomised controlled trials (RCTs)  Systematic reviews |
| STRengthening the Reporting of OBservational studies in Epidemiology (STROBE) | Checklists for:  Case-control studies  Cohort studies  Cohort, case-control and cross-sectional studies (combined)  Cross-sectional studies |
| ROBINS-I A tool for assessing the risk of bias in non-randomised studies of interventions. | In target trial, the effect of interest is typically that of either:  Assignment to intervention at baseline (start of follow up), regardless of the extent to which intervention was received during follow-up (sometimes referred to as “intention-to-treat” effect)  Starting and adhering to intervention as indicated in the trial protocol (sometimes referred to as the “per-protocol” effect). |
| JBI Critical Appraisal Tools (https://joannabriggs.org/ebp/critical\_appraisal\_tools) | Checklists for the following study designs:  Cohort, case-control and cross-sectional studies (combined)  Checklist for Analytical Cross-Sectional Studies  Checklist for Case-Control Studies  Checklist for Case Reports  Checklist for Case Series  Checklist for Cohort Studies  Checklist for Diagnostic Test Accuracy Studies  Checklist for Economic Evaluations  Checklist for Prevalence Studies  Checklist for Quasi-Experimental Studies (non-randomised experimental studies)  Checklist for Randomised Controlled Trials  Checklist for Systematic Reviews  Checklist for Text and Opinion |
| AMSTAR 2 – Assessing the methodological quality of systematic reviews | <https://amstar.ca/Amstar-2.php> |
| ROBIS: A risk of a bias assessment tool for systematic reviews | Tool completed in 3 phases:  1. Assess relevance (optional)  2. Identify concerns with the review process  o Study eligibility criteria  o Identification and selection of studies  o Data collection and study appraisal  o Synthesis and findings.  3. Judge risk of bias. |
| Case studies (Atkins and Sampson, 2002) | Case studies |
| Mixed-Methods Studies (Pluye & Hong, 2014) | http://mixedmethodsappraisaltoolpublic.pbworks.com/w/page/24607821/FrontPage |
| **Topic-specific checklists** | |
| Evidence-based library and Information science (<http://ebltoolkit.pbworks.com/f/EBLCriticalAppraisalChecklist.pdf>) | |
| Education – ReLIANT (Readers guide to the Literature on Interventions Addressing the Need for education and training)(Koufogiannakis et al., 2008) | |
| **Generic checklists** | |
| Standard quality assessment criteria for evaluating primary research papers from a variety of fields (Kmet et al., 2004) | |

*Table 6‑11: Key quality assessment checklist resources – qualitative designs*

|  |  |
| --- | --- |
| Qualitative study design checklists | |
| **Resource** | **Details** |
| Critical Appraisal Skills Programme  <https://casp-uk.net/wp-content/uploads/2018/01/CASP-Qualitative-Checklist-2018.pdf> | 10 questions to help you make sense of Qualitative research. Designed for reading single qualitative research articles but extensively used in qualitative evidence syntheses |
| Joanna Briggs Institute (JBI)  <https://joannabriggs.org/sites/default/files/2020-08/Checklist_for_Qualitative_Research.pdf> | Developed by JBI and collaborators and approved by JBI Scientific Committee following extensive peer review. Designed for use in systematic reviews, but also used to create Critically Appraised Topics (CAT), in journal clubs and as an educational tool. |
| National Institute for Health and Clinical Excellence  [https://www.nice.org.uk/process/pmg4/chapter/appendix-h-quality-appraisal-checklist-qualitative-studies#checklist-2](https://www.nice.org.uk/process/pmg4/chapter/appendix-h-quality-appraisal-checklist-qualitative-studies" \l "checklist-2) | Designed for those with basic knowledge of qualitative research. Used in producing public health guidance. 14 questions with categorical responses. |
| Qualitative research (Dixon-Woods et al., 2006) | Brief prompts for qualitative research designed for experienced qualitative researchers |
| **Quality Framework** (Cabinet Office)<https://www.gov.uk/government/publications/government-social-research-framework-for-assessing-research-evidence> | Exhaustive tool for social research compiled from literature review of quality assessment concepts |
| **Specialist Unit for Review Evidence (SURE)**  <https://www.cardiff.ac.uk/__data/assets/pdf_file/0007/1142971/SURE-CA-form-for-Qualitative_2018.pdf> | Adapted/updated from former Health Evidence Bulletins Wales checklist with reference to NICE Public Health Methods Manual (2012) and previous versions of Critical Appraisal Skills Programme (CASP) checklist |

*Table 6*-*13: Quality assessment of an article*

|  |  |  |
| --- | --- | --- |
| Study reference | Study design | Checklist |
| Chocolate flavanols and skin photoprotection: a parallel, double-blind, randomized clinical trial. (Mogollon et al., 2014) | RCT | Critical Appraisal Skills Programme  <https://casp-uk.net/wp-content/uploads/2018/01/CASP-Randomised-Controlled-Trial-Checklist-2018.pdf> |
| Dying to be famous: a retrospective cohort study of rock and pop star mortality and its association with adverse childhood experiences (Bellis et al., 2012) | Cohort study | Critical Appraisal Skills Programme  <https://casp-uk.net/wp-content/uploads/2018/01/CASP-Qualitative-Checklist-2018.pdf> |
| Robotic Seals as Therapeutic Tools in an Aged Care Facility: A Qualitative Study (Birks et al., 2016) | Qualitative study | Critical Appraisal Skills Programme  <https://casp-uk.net/wp-content/uploads/2018/01/CASP-Cohort-Study-Checklist_2018.pdf> |