
A critical appraisal tool for qualitative and quantitative research

Michael Crowe

A critical appraisal tool

- When are CATs used?
 - Evidence based practice
 - Systematic and literature reviews
 - Assess validity and reliability of research
- What is the problem with current CATs?
 - Narrow focus
 - Lack design rigour
 - Little/no validity or reliability testing
- Why is this CAT different?
 - Based on theory and evidence

A critical appraisal tool

- Types of research
- Valid
- 8 categories
- Reliable (ICC2) Consistency 0.83 Range 0.64–0.91 Absolute 0.74 Range 0.57–0.73
- 22 items
- 53–97 descriptors
- Mark descriptors
 - Present
 - Absent
 - Not applicable
- 3 raters
- Future research
- Ongoing
- Volunteers
- Score 0–5
- User guide

Category	Description of item	Score
1. Preliminary		
Title	1. Includes study aims <input type="checkbox"/> and design <input type="checkbox"/>	Prelim score
Abstract	1. Contains key information <input type="checkbox"/> 2. Balanced <input type="checkbox"/> and informative <input type="checkbox"/>	
Text	1. Sufficient detail others could reproduce <input type="checkbox"/> 2. Clear/concise writing <input type="checkbox"/> , table(s) <input type="checkbox"/> , diagram(s) <input type="checkbox"/> , figure(s) <input type="checkbox"/>	
2. Introduction		
Background	1. Summary of current knowledge <input type="checkbox"/> 2. Specific problem(s) addressed <input type="checkbox"/> and reason(s) for addressing <input type="checkbox"/>	Intro score
Objective	1. Primary objective(s), hypothesis(es), or aim(s) <input type="checkbox"/> 2. Secondary question(s) <input type="checkbox"/>	
3. Design		
Research design	1. Research design(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Suitability of research design(s) <input type="checkbox"/>	Design score
Intervention, treatment, exposure	1. Intervention(s)/treatment(s)/exposure(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Precise detail of interventions/treatments/exposures <input type="checkbox"/> for each group <input type="checkbox"/> 3. Intervention(s)/treatment(s)/exposure(s) valid <input type="checkbox"/> and reliable <input type="checkbox"/>	
Outcome, predictor, measure	1. Outcome(s)/output(s)/predictor(s)/measure(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Clearly define outcome(s)/output(s)/predictor(s)/measure(s) <input type="checkbox"/> 3. Outcome(s)/output(s)/predictor(s)/measure(s) valid <input type="checkbox"/> and reliable <input type="checkbox"/>	
Bias, etc	1. Potential bias <input type="checkbox"/> , confounding variable <input type="checkbox"/> , effect modifier <input type="checkbox"/> , interactions <input type="checkbox"/> 2. Sequence generation <input type="checkbox"/> , group allocation <input type="checkbox"/> , balance <input type="checkbox"/> , and by whom <input type="checkbox"/> 3. Equivalent treatment of participants/cases/groups <input type="checkbox"/>	
4. Sampling		
Sampling method	1. Sampling method(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Suitability of sampling method <input type="checkbox"/>	Sample score
Sample size	1. Sample size <input type="checkbox"/> , how chosen <input type="checkbox"/> , and why <input type="checkbox"/> 2. Suitability of sample size <input type="checkbox"/>	
Sampling protocol	1. Target/actual/sample population(s): description <input type="checkbox"/> and suitability <input type="checkbox"/> 2. Participants/cases/groups: inclusion <input type="checkbox"/> and exclusion <input type="checkbox"/> criteria 3. Recruitment of participants/cases/groups <input type="checkbox"/>	
5. Data collect		
Collection method	1. Collection method(s) chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Suitability of collection method(s) <input type="checkbox"/>	Data collect score
Collection protocol	1. Dates <input type="checkbox"/> , locations <input type="checkbox"/> , settings <input type="checkbox"/> , personnel <input type="checkbox"/> , materials <input type="checkbox"/> , processes <input type="checkbox"/> 2. Method(s) to ensure/enhance quality of measurement/instrumentation <input type="checkbox"/> 3. Manage non-participation <input type="checkbox"/> , withdrawal <input type="checkbox"/> , incomplete/lost data <input type="checkbox"/>	
6. Ethics		
Participant ethics	1. Informed consent <input type="checkbox"/> , equity <input type="checkbox"/> 2. Privacy <input type="checkbox"/> , confidentiality/anonymity <input type="checkbox"/>	Ethics score
Researcher ethics	1. Ethical approval <input type="checkbox"/> , funding <input type="checkbox"/> , conflicts of interest <input type="checkbox"/> 2. Subjectivities <input type="checkbox"/> , relationship(s) with participants/cases <input type="checkbox"/>	
7. Results		
Analysis, interpret. method	1. Methods for primary outcomes/predictors chosen <input type="checkbox"/> and why <input type="checkbox"/> 2. Additional methods (e.g. subgroup analysis) chosen <input type="checkbox"/> and why <input type="checkbox"/> 3. Suitability of analysis/integration/interpretation method(s) <input type="checkbox"/>	Results score
Essential analysis	1. Flow of participants/cases/groups through each stage of research <input type="checkbox"/> 2. Demographic and other characteristics of participants/cases/groups <input type="checkbox"/> 3. Raw data <input type="checkbox"/> , response rate <input type="checkbox"/> , non-participate/withdraw/incomplete/lost <input type="checkbox"/>	
Outcome, predictor analysis	1. Summary results <input type="checkbox"/> & precision <input type="checkbox"/> for each outcome/predictor/measure 2. Consider benefit/harm <input type="checkbox"/> , unexpected result <input type="checkbox"/> , problem/failure <input type="checkbox"/> 3. Describe outlying data (e.g. diverse case, adverse effect, minor theme) <input type="checkbox"/>	
8. Discussion		
Interpret	1. Interpret of results in the context of current evidence <input type="checkbox"/> and objectives <input type="checkbox"/> 2. Draw inferences consistent with the strength of the data <input type="checkbox"/> 3. Consideration of alternative explanations for observed results <input type="checkbox"/> 4. Account for bias <input type="checkbox"/> , confounding/effect modifier/interaction/imprecision <input type="checkbox"/>	Discuss score
Generalise	1. Consideration of overall practical usefulness of the study <input type="checkbox"/> 2. Description of generalisability (external validity) of the study <input type="checkbox"/>	
Concluding remarks	1. Highlight study's particular strengths <input type="checkbox"/> 2. Suggest steps that may improve future results (e.g. limitations) <input type="checkbox"/> 3. Suggest further studies <input type="checkbox"/>	