

CRITICAL REVIEW OF A PAPER

How to Critically Review a Paper?

1. Determine what a paper is about

- Why was the study done (what question did it examine)?
- Is there a clear description of the problem?
- Is the study useful and relevant to your topic?
- Was the study design appropriate to the broad field of research examined?
- What type of study was done?
 - Primary research (experiment, randomized controlled trial, cohort study, case-control study, cross sectional survey, longitudinal survey, case report etc.)
- OR
 - Secondary research (simple overview, systematic review, meta-analysis, decision analysis, guideline development, economic analysis)
- Was the study ethical?
 - Are there any ethical objections to the design or reporting of the study
- Is there a review of the literature?
- Is the writing style easily understood?
- Is the paper well laid out and easy to follow?

2. Paper methodology

- The design of the study is consistent with the aims
 - Observational studies - qualitative, by interviewing
 - Observational studies - quantitative, obtain baseline values
 - Retrospective studies - information from past events
 - Prospective studies - following events as they happen
 - Experimental Studies - e.g. randomized control trial
- Was the design of the study sensible?
- Was the study original?
- Who is the study about?
- Is sample of the study representative of the population as a whole?
- How were subjects recruited?
- Are controls needed in the study?
 - If a cohort, case-control, or other non-randomized comparative study were the controls appropriate?
- Who was included in and who was excluded from the study?
- Are methods of selecting cases and controls defined well?
- Were the subjects studied in "real life" circumstances?
- What intervention or other maneuver was being considered?
- Are details of the study such as numbers, time intervals, statistical test used clear and appropriate?
- Are the questionnaire and performas appropriate and relevant to the study?
- Was the study adequately controlled?
- If a "randomized trial" was randomization truly random?
- Were the groups comparable in all-important aspects except for the variable being studied?

- What outcome were measured and how?
- Was assessment of outcome (or, in a case-control study, allocation of cases) "blind"?
- Are there sources of bias in the setting of the subjects?
- Have confounding influences and multiple influences been removed?
- Was the study large enough, continued for long enough, and was follow up complete enough, to make the results credible?

3. Statistical aspects of a paper

- Have the authors set the scene correctly?
 - Have they determined whether their groups are comparable and, if necessary, adjusted for baseline differences?
 - What sort of data have they got and have they used appropriate statistical tests?
 - If the statistical tests in the paper are obscure why have the authors chosen to use them?
 - Have the data been analyzed according to the original study protocol?
- Paired data, tails, and outliers:
 - Have the appropriate tests been used e.g. t-test for distributions, chi square tests for dichotomous values?
 - Were paired tests performed on paired data?
 - Was a two tailed test performed whenever the effect of an intervention could conceivably be a negative one?
 - Were outliers analyzed with both common sense and appropriate statistical adjustments?
- Correlation, regression and causation:
 - Has correlation been distinguished from regression and has the correlation coefficient (r value) been calculated and interpreted correctly?
 - Have assumptions been made about the nature and direction of causality?
- Probability and confidence and degree of significance been interpreted correctly:
 - Have P values been calculated and interpreted appropriately?
 - Have confidence intervals been calculated and do the authors' conclusions reflect them?

4. Result aspects of a paper

- Missing data such as drop outs, non-responders are accounted for
- Details of the results such as the numbers, statistics, are accurate and clear
- If statistics are appropriate to the study, then they were well used
- The sample size is of a significant amount
- Are the results clearly presented?
- Have the bar charts, tables appropriately used

5. Discussion aspects of a paper

- The study is discussed critically
- The results are discussed with reference to other important literature
- The discussion and conclusions do not speculate too far beyond what has been shown in the study.

Checklist for a qualitative research paper

- Did the article describe an important clinical problem examined via a clearly formulated question?
- Was the qualitative approach appropriate?
- How were the setting and the subjects selected?
- What was the researcher's perspective and has this been taken into account?
- What methods did the researcher use for collecting data—and are these described in enough detail?
- What methods did the researcher use to analyze the data—and what quality control measures were implemented?
- Are the results credible and if so are they clinically important?
- What conclusions were drawn and are they justified by the results?
- Are the findings of the study transferable to other clinical settings?