

Critique a Research Article

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Reading literature

- * **One of the most valuable skills to develop is an ability to critically evaluate literature & critique a study**
- **Understand the study**
 - * **Main research question**
 - * **Study population**
 - * **Study design**
 - * **Sample selection**
 - * **The independent and dependent variables**
 - * **What are they? How were they measured?**
 - * **Study results**
 - * **Authors' interpretations and stated strength/limitations**

The Body of a Research Article

- **Abstract**
- **Introduction**
- **Methods**
- **Results**
- **Discussion**



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Critiquing an Article

- * The title
 - * Clear, readily understood, related to content
- * Abstract
 - * States problem; methodology described; results summarized; conclusions stated
- * Problem
 - * Problem statement is clear; hypothesis stated; can identify limitations and assumptions; significance of the problem discussed and research is justified

Abstract

- **A well-written abstract should provide key highlights from each of the article sections**
 - ★ **Main research question**
 - ★ **Study population and design**
 - ★ **Sample selection**
 - ★ **Primary exposure/treatment and outcomes**
 - ★ **Results**
 - ★ **Authors' interpretations**

Introduction

- **Introduction often follow a general format**
 - We know...*
 - We don't know....*
 - We aim to find out...*
- **Delineates study objectives (and hypotheses)**
 - *e.g. Test whether vitamin D deficiency is associated with progression of disease in multiple sclerosis*

Review of the Literature

- * Literature review is pertinent to the problem
- * Cited literature provides rationale for the research
- * Relationship of problem to previous research is clear
- * Conceptual framework/ rationale is clear
- * Review concludes with brief summary of literature and implications to research problem

Methods

- **Provides details on how study was actually conducted**
 - ★ **Underlying population from which participants were drawn and how selected**
 - ★ **Study design**
 - ★ **Sample size**
 - ★ **Exposures/Treatments (definitions, how measured)**
 - ★ **Outcomes (definitions, how measured)**
 - ★ **Analysis type used in the study**

Methodology

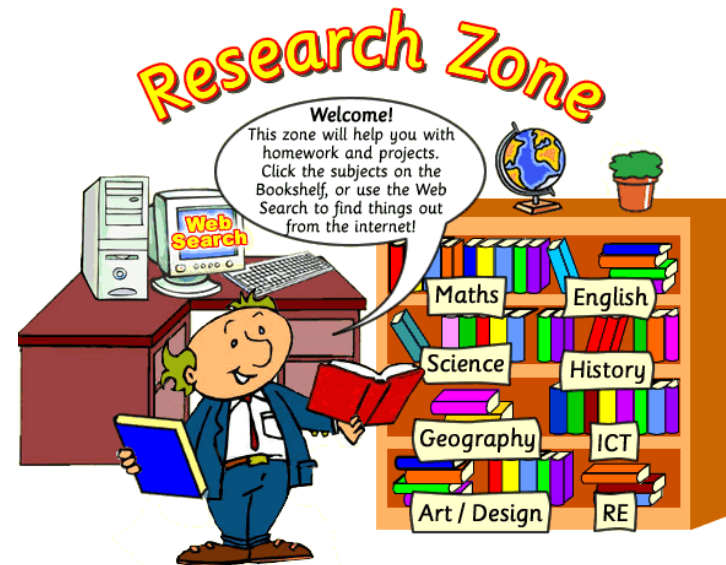
- * Subjects described
- * Sampling method is described and justified
- * Sample size sufficient to reduce type II error
- * Protection of subjects discussed
- * Data collection
 - * Reliability and validity of instruments stated
 - * Data collection methods appropriate
- * Design
 - * Appropriate to study hypothesis
 - * Confounding variables identified
 - * Design description explicit to permit replication

Results

- **Results with descriptive details of the sample**
 - ★ Sample characteristics?
 - ★ Response rate (Who enrolled?)
 - ★ How many people were exposed overall? Had or developed outcome of interest?
- **Main association of interest described in detail**
 - ★ Associations (Odds Ratio, Risk Ratio)
 - ★ Subgroup analyses
 - ★ Adjusted associations
 - ★ Graphs and tables

Analysis

- * Information presented sufficient to answer research questions
- * Statistical tests used are identified and obtained values are reported
- * Reported stats are appropriate for hypothesis
- * Tables and figures are easy to understand



Discussion

- **Most important findings are typically outlined in first paragraphs, with scientific or public health implications**
 - ★ **Placed in context of other studies (Consistent? Contradictory? Altogether new?)**
 - ★ **Potential biological and social processes underlying the observed associations are considered**
- **Limitations of study are outlined and weighed**
- **Unanswered questions identified**

Discussion

- * Conclusions stated clearly
- * Conclusions substantiated by evidence
- * Methodological problems identified and discussed
- * Findings related to theory
- * Implications of findings discussed
- * Results generalized only to population on which study is based
- * Recommendations are made for further research



Think on your own...

- **A LONGITUDINAL STUDY OF ABNORMALITIES ON MRI AND DISABILITY FROM MULTIPLE SCLEROSIS**
- New England Journal of Medicine 2002; 346:158-64.
 - ★ **Main research question**
 - ★ **Study population and design**
 - ★ **Sample selection processes**
 - ★ **Primary exposures and outcomes**
 - ★ **What are they?**
 - ★ **How were they measured?**
 - ★ **Result, precision?**
 - ★ **Author's interpretations**