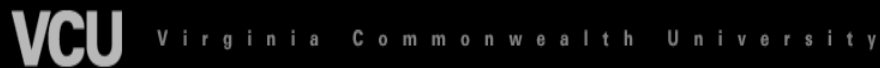


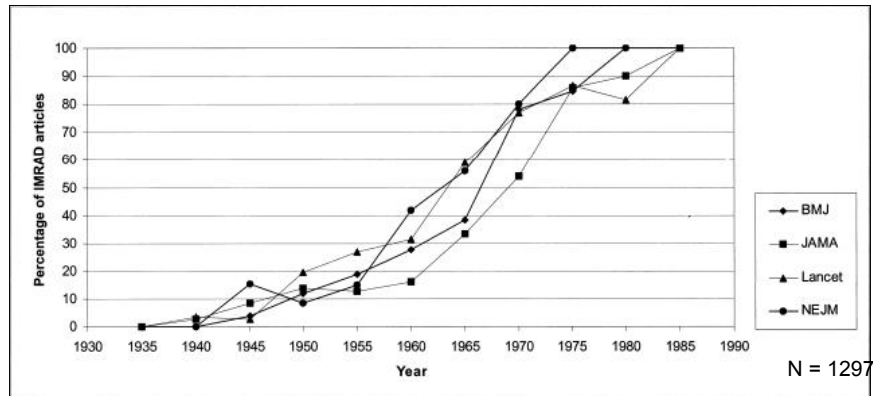
Preparation and submission of manuscripts/resubmissions

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Standardized Structure for Journal Articles – IMRaD

- Observational and experimental articles usually divided into 4 sections
 - Introduction
 - **M**ethods
 - **R**esults
and
 - **D**iscussion
- Reflective of the process of scientific discovery
- Used as early as 1865, but not standardized until the 20th century
 - Wide use credited to editors to benefit readers and facilitate peer review



- IMRAD fully adopted structure in
 - 1975 for NEJM,
 - 1980 for BMJ
 - 1985 for JAMA and The Lancet

Sollaci et al. (2004)

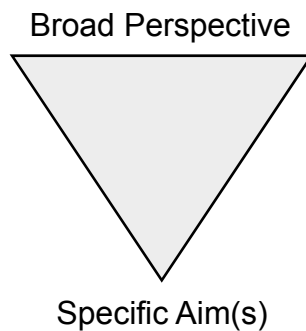
IMRaD

- Helps researchers easily find relevant details
- Facilitates reading
 - Can easily go to the section of interest
 - Helps cognitively chunk and make sense of information

Introduction

What question was asked?

- Think “short” and “arresting”
→ why your study has been done.



Introduction: Structure

- 1st Paragraph
 - Short story of the current knowledge of the research area
 - What do we know?
- 2nd Paragraph
 - What have others done in that field
 - Limitations encountered to date
 - Questions left unanswered (what don't we know)
- 3rd Paragraph
 - What your study does and why
 - What gaps are you trying to fill or controversies are you trying to resolve?
 - The specific aim(s) of the study – The hypotheses being tested
 - This is the MOST important part of the introduction

Introduction: Specific Aims

- Primary and secondary specific aim(s) should be specified *a priori*
- Aims could be to answer research questions or to test research hypotheses
- A research question is a question
 - Do employment rates 1 to 5 years post TBI increase within separate race/ethnicity groups?
 - Are the changes in employment rates 1 to 5 years post TBI different between the race/ethnicity groups?
- A hypothesis is a statement
 - Whites, Blacks, and Hispanics will all show significant increases in employment rates 1 to 5 years post injury.
 - The increases in employment rates will be significantly greater for Whites as compared to Blacks and Hispanics.

Introduction: Advice

- Know your audience
- Keep it short
- Clearly explain why you did the study and why it is important
- Hook the audience with the first line
- Only cite references (and results) based on rigorous and valid studies that are relevant to justify your study
- Do not alter your hypotheses to fit your results
- Do not include data, results, or conclusions from your study

Methods

How was it studied?

- Think “reproducibility” → scientific merit
- How was the study designed and carried out
- Who were the participants
- What material and methods were used
- How was the data analyzed
- Ideally, you should be able to write this part of the paper before you even get the data.
 - Can help identify design flaws
 - May make it more concise after data analysis.

Methods: Structure

- Study design
 - RCT, double-blind, prospective, retrospective, cross-over, etc
- Setting
 - single vs. multicenter, rural vs. urban
- Selection of participants/subjects
 - Inclusion/exclusion criteria (including justification)
 - IRB approval, consent
- Procedures/Equipment
 - Include exact technical specifications and quantities
 - Randomization details

Methods: Structure

- Outcome/Dependent Variable
 - What response are you looking for and how will you measure it?
 - Reliability/Validity
- Predictor/Independent variables
 - Treatment groups?
 - Mediating or Moderating effects? Justification/Reliability/Validity
- Sample size
 - Are you wasting your time? Do you have power?
- Statistical Analysis
 - Methods, software, significance level, effect sizes, statistical terms, abbreviations, and symbols

Methods: Advice

- Methods are written BEFORE data collection
 - So...do not report results based on your data in the methods
- Be specific → reproducibility?
- Know your audience
- Justify unfamiliar statistical tests
- Avoid results based solely on hypothesis tests
 - They do not convey the “effect size”
 - Use confidence intervals
- Subheadings should match results if possible

Results

What was found?

- Guide the reader logically through the analysis – stick to the methods
- Description of the subjects
 - Demographics
 - #s Screened, eligible, recruited, excluded
- Compliance with protocol/methods
- Preliminary analyses
 - Compare groups (complete/incomplete data, not randomized)
- Address the aim(s) of the study
- Post-Hoc analyses.

Results: Advice

- Do not interpret the implication of the results – but do interpret the results
 - Don't expect the reader to know how to do this
 - Again – know your audience
- Be specific – use numbers, describe directions
- Always report point estimates, standard errors, and 95% confidence intervals
 - Test statistics, degrees of freedom, p-values becoming less common.

Results: Describing Data

- Normally distributed continuous variables
 - Means and standard deviations
 - 1 decimal more than the data, 2 decimals more than the data
- Skewed continuous variables (mean \neq median)
 - medians and interquartile ranges (or ranges)
- Nominal (categorical variables)
 - Counts and percentages
 - If $N < 20$, counts only
 - If $N < 100$ counts and percents with 0 decimal places
 - If $N \geq 100$ counts and percents with 1 decimal place

Results: Tables and Figures

- *May* be helpful – if used to summarize more concisely, enhance or clarify the results
- Must be referenced to in text
- Text, tables, figures should not be repetitive
- Should be able to stand alone from the text
 - Use clear titles, headings, legends, footnotes

Discussion

What do the findings mean?

- Start by briefly summarizing the main findings related to the aims of your study and why they are important
- Then explore possible mechanism/ explanations for these findings
- Compare and contrast your results with other relevant studies
- State the strengths and limitations of your study
- Explore the implications of the findings for future research and for clinical practice

Discussion: Advice

- Can be the toughest section to write
 - Exercise in logic and skill
- Relate your conclusions to the aims
 - Avoid conclusions not supported by the study
- Don't emphasize the strengths over the weaknesses
- Don't inflate the importance of your findings
- Do find a way to end the paper with a good "so what" factor

Abstract

- Approximately one paragraph long
 - 200 - 300 words
 - Summarizes the objective, methods, major results, and interpretations and conclusions of the manuscript.
- First Impression:
 - Readers often use the abstract to decide if the information contained in the body of the paper is of interest to them.

Abstracts should include . . .

- One to two sentences for each of the following items:
 - The problem to be investigated;
 - The purpose of the study;
 - The methods;
 - The major results;
 - The interpretations;
 - The implications.

Other details

- Present tense is used to quote previously published work as a sign of respect for established knowledge
 - Much of Introduction/Discussion)
- When referring to one's own present work, the past tense should be used, as this work is not presumed to be established knowledge until after it has been published.
 - Methods/Results

Questions??

References

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- Todorovic et al. (2003) Original (scientific) paper – the IMRAD layout. Archive of Oncology 2003; 11(3): 203-5.
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