of a research paper

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Objectives

- Learners will be able to:
  - Identify the key sections of a research paper
  - Understand the structure of a research paper
  - Avoid common pitfalls about the writing of a research manuscript
Introduction

1. The **problem** supported by few key refs, the current status (*What is known*)

2. Justify the **need** for the study
   Importance of the problem
   gaps in current knowledge (set your “so what early”)

3. Hypothesis, research question and statement of **purpose**
Introduction - The shape

- The shape
- What is known about the topic
- The problem
- Support for
- The need
- Support for
- Research question
- The purpose
- The purpose
Introduction - JAMA example - p 1086

Background - The problem

The problem | Key refs

The need for the study

Current knowledge | gaps

Purpose

Hypothesis | Research question
Methods

- Reader should be able to replicate the study
- Describe in detail how the study was performed
- Describe variables and how they were measured
  - describe instrument(test, survey, CBP, ..) if you used
Methods

- Study population and setting
- Study design
- Data collection
  - sampling strategy, sample size may be included here
- Data measurement
  - An *Intervention* may be included here
- Outcomes
- Data analysis
  - Power calculations, level of significance may be reported here
Methods: JAMA-example p.1072-1073

- IM residents..., SP
- Prospective cohort--SD
- Residents 2003, 2004--DC
- Self reported medical errors, burnout--DM
- Frequency of errors and association with burnout--O
- Comparisons of means...--DA
Methods

- **Data analysis (Quantitative):**
  - Select the appropriate statistical tests
  - Describe the variables reported (means vs. medians)
  - Describe statistical tests utilized
    - Univariate
    - Multivariate (may have to explain why you use certain statistical analysis)
  - Reference statistical software used
  - Don’t forget IRB statement!
Data analysis (Qualitative):

- Select the appropriate analysis
- Describe the qualitative approach used and why
- Use the appropriate sampling strategy that matches the qualitative method.
- Describe details of the qualitative method that was used
- Reference statistical software if used
- Don’t forget IRB statement!
Results

- Include only data, do not repeat introduction/background or method sections
- Provide only data relevant to the research question/purpose
- State findings without interpretation
- No references are usually in this section
Results

- Report all results you proposed to measure in the method section
  - Integrate table and text

- Present your results in the same order as you described them in the method section (easy for the reader to follow)

- Start with descriptive data then inferential statistics
Results-Tables and Figures

- Use them to show the results that matter the most.
- Use table /figure to convey the message most effectively.
  - Table 1 usually demographics/baseline characteristics/descriptive.
  - Table 2 outcomes.
- Title and legend need to be clear and easy to understand (association, comparison, predictors, etc).
- Make sure numbers add up.
Discussion

- Brief summary of main results (1 paragraph)
- Explain meaning of your results
- Discuss and interpret results
- Compare and contrast your findings with appropriate studies in the literature
- Avoid repeating the result section
Discussion

- Acknowledge limitations of your study
- Use your limitation section!!

Purpose of the the limitation section is:
  - To identify key limitations of your study and type (methodological, theoretical, conceptual, etc)
  - To explain the degree or “magnitude “of the limitations
  - To set up ideas for future research
Discussion

- Summarize your study findings
- Novelty of your findings, compared to other literature (be selective with the literature)
- Compare and contrast with other studies
- Acknowledge limitations before the reviewers do
- Summarize the potential significance of your findings and/or changes your study may support

Always keep in mind the research question!

Do not repeat the intro!

Do not overstate your findings!
Summary

- The Problem, the Need, the Purpose/Question
- Utilize the appropriate methods to answer the question
- Report most relevant findings
- Interpret your findings and what they mean
- All the sections need to be linked and “flow”
“Research is to see what everybody else has seen, and to think what nobody else has thought”

Albert Szent-Gyorgyi
(Hungarian Biochemist, 1937 Nobel Prize for Medicine, 1893-1986)

THANKS!!!