Research
442

Revised by
Deema · Fatima · Talal · Ahmed · Mohammed

How to read a research paper

Lecture No. 3

Objectives:

1. To understand the purpose of reading a research paper
2. To realize the components of a research paper
3. To recognize the importance of each component and its relevance
4. How to go through a paper quickly (Three-pass approach)

~ This lecture is presented by Dr. **Basmah** Almujadidi, It's a **new Lecture**
~ It is included in the **midterm Exam**
~ We highly recommended reading the **Ayah** in the first page

Slides

Color code

Original text
Dr. Notes
Important
Golden note
Extra

Editing file

What is a scientific/ research paper?

Definitions

- A scientific paper is **a manuscript that represents an original work of scientific research or study (data and interpretations).**
- A manuscript becomes **a paper or article** when it is published.
- A published research paper makes new data available for others to learn from and build upon to address new questions.

قال صلى الله عليه وسلم:

من كانتِ الآخرةُ هَمَّهُ جعلَ اللهُّ غناهُ في قلبِهِ وجمعَ لَه شملَهُ وأتتهُ الدُّنيا وَهيَ راغمةٌ، ومن كانتِ الدُّنيا همَّهُ جعلَ اللهُّ فقرَهُ بينَ عينيهِ وفرَّقَ عليهِ شملَهُ، ولم يأتِهِ منَ الدُّنيا إلاَّ ما قُدِّرَ لَهُ

Background

- The history of scientific papers dates back to 1665 in England and France.
- The structure of scientific papers evolved from letters and descriptive experimental reports to a structured form with a description of methods and interpretation of results.
- In the 1980's a formal Introduction, Methods, Results, and Discussion (IMRAD) structure of scientific papers was adopted.
- The International Committee of Medical Journal Editors (ICMJE)[1] works to improve the quality of medical science and its reporting.

[1] They meet every year and check for the quality and guidelines for writing the paper

Reading papers published in reputable peer-reviewed journals:

- Prepare the **literature review** for your own research paper
- Provides **up to date** information on a topic that you are interested in
- Is a professional way of **scientific communication** of diverse research ideas, findings and results
- Understanding different types of **research methods and methodologies**
- Allows the reader to **critique and evaluate** other studies

Methodology: for the intention of the researcher

Methodes: how the research is done

Critique: talking about disadvantages with intention to fix the problem

Criticism: only talking about disadvantages

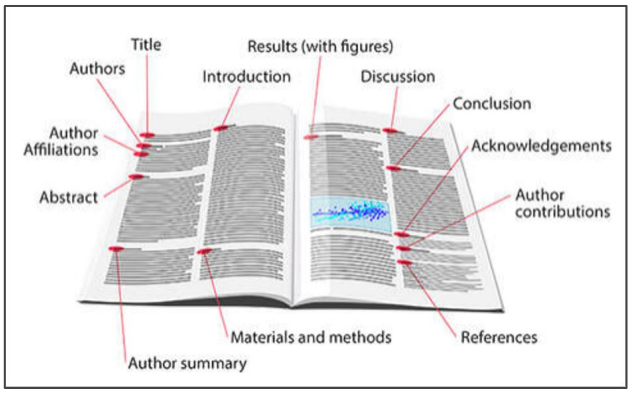
Anatomy of scientific paper
Asking the right questions

Components of a scientific/research paper:

- Title
- Authors and affiliations
- Abstract
- Keywords
- **I**ntroduction/Background
- **M**ethods and materials
- **R**esults
- **D**iscussion
- Conclusion
- Acknowledgements
- Author contributions
- References

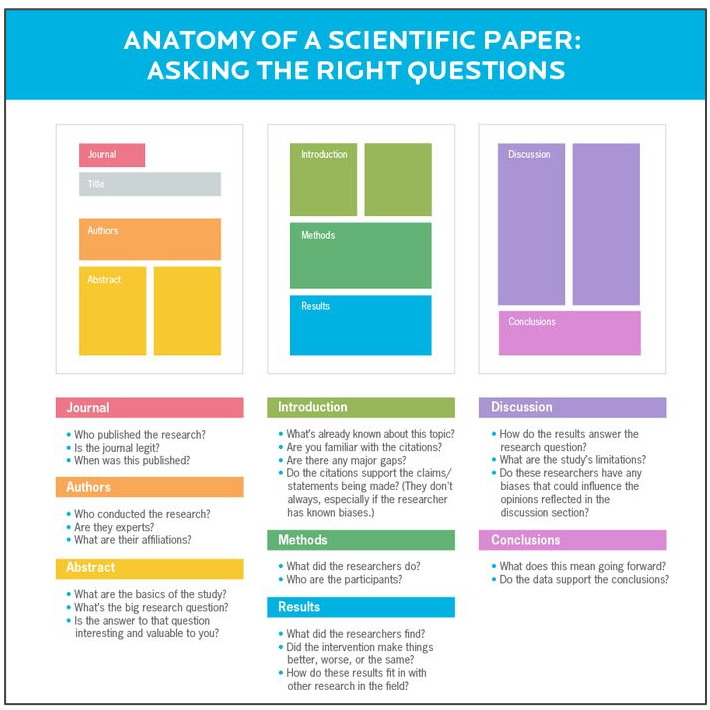
"IMRAD" Body of the paper

Do not make the reason of rejection of your manuscript for not following the guidelines, make it for the data, discussion or result inconsistencies



Title

- **First element to be noticed!**
- Titles determine the **indexing process and visibility of the article,** they include important keywords of the study that rise up to the top of the readers search index/engine list.



Anatomy of scientific paper

Abstract

"Sets the tone for the rest of the paper"

The last thing to write

Very important for the paper

- It is an abbreviated or summarized mini-version of your manuscript
- Generally an abstract has:
  - Background/Introduction (context and purpose of the study)
  - Methods (statistical tests)
  - Results (the main findings)
  - Conclusions (summary and implications)
- it's the first to be read but usually written last

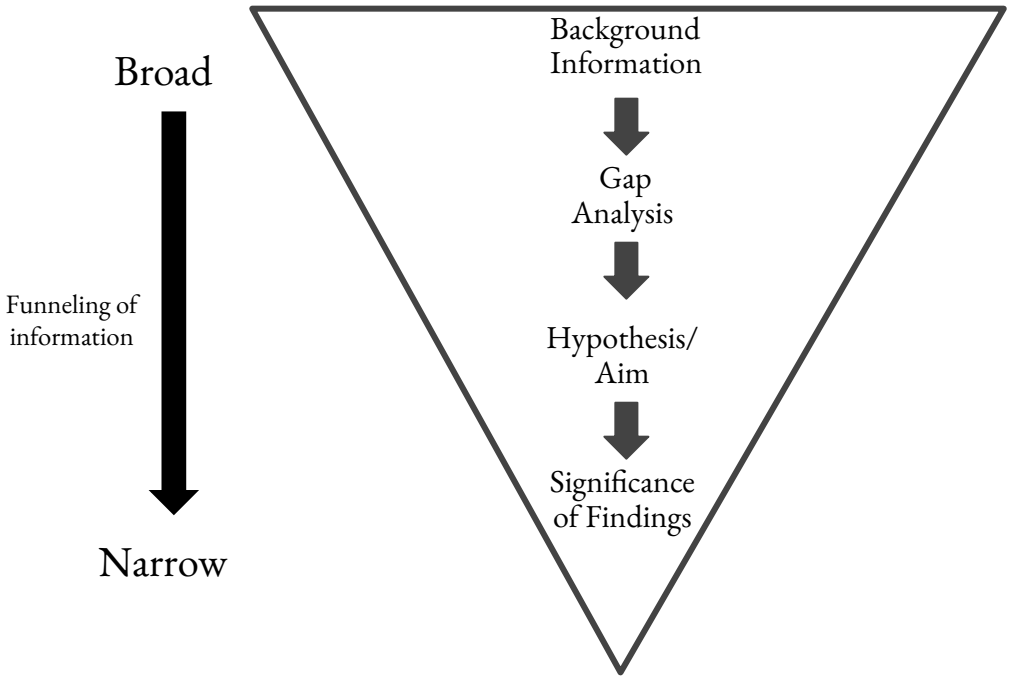
Introduction/Background

"What did others do?"

1. A brief review of the literature
2. Aim is to introduce the topic in a short and focused way
3. **First paragraph** (what is known)- the context, relevance, or nature of the problem, question, or purpose
4. **Second paragraph** (what is unknown)- the importance of the problem and unclear issues (the gap in previous research)
5. **Last paragraph** (why the study was done) - the rationale, hypothesis, main objective or purpose, research question
6. Usually written before last [in reality, we do it first :)]

Anatomy of scientific paper

The Structure of an Introduction Section



- ❑ **What are** the **gaps** in our present understanding of my field of study?
- ❑ Why is it **important** for researchers in my field of study to fill in the **gaps**?
- ❑ What did other **published** studies find and what did I **discover**?
- ❑ How would my **findings fill** in those **gaps**?

Methods & Materials

"How did you do it?"

- It is usually drafted first in the writing process of a manuscript
- The technical aspect of the research study and one of the most important sections
- It aims to give the reader all the necessary details to allow them to repeat or replicate the study (design, sample, recruitment, data collection, data analysis)

Materials are associated with labs research (also called tools)

Methods are study design

Literature review includes a detailed methods

Results

"What did you find?"

- Organized presentation of the data collected
- Only describes the findings, **no interpretation** in this section
- Utilizing tables and graphs and the showcasing the outcomes generated

Anatomy of scientific paper

Discussion

"What does it all mean?"

- Starts with simple statement of the key findings and whether they are consistent with the research question and study objectives
- Explains and analyzes the findings, puts them into a broader scientific context
- Highlights the **strengths** of the study and what it adds to the current knowledge
- Criticizes and acknowledges the study's **limitations** and strengths

Conclusions/Summary

- A concise and clear summary of the findings, "take home" message
- Suggestions for future investigation and implications for current clinical practice

References

EN

- Citation guidelines and styles (APA, MLA, Chicago, Vancouver, Harvard, etc.) are used by the individual journal and formatting instructions, including those for books and web-based references

- Software programs such as Endnote® (Thomson Reuters) can help manage the references and citation

"APA"

How to read a scientific/research paper?

- Screen the **title** first, if it is relevant, read the **abstract** for more detail on the research methods and key findings
- Read the **last paragraph of the introduction** (ask yourself is the purpose of the paper clear and justified from the background information provided?)
- Then the **first paragraph of the discussion** and Look at the **tables and figures** (did the results answer the research question? Were they interpreted well within the context?)
- Or you could use the **three-pass approach**

[1] It can be used for the literature review, it gives more resources for the paper

Three-pass Approach

First Pass **"Select"**	**General idea about the paper** • 5-10 mins • Read the title, abstract, introduction & conclusion • Quick glance over the references [1] • 5 C's: Category, Context, Correctness, Contribution, and Clarity
Second Pass **"Understand"**	**Grasp the papers contents by not in details** • 1-2 hrs • Read methods, results & discussion • Pay special attention to graphs, figures, diagrams, and illustrations • Read referred articles
Third Pass **"Implement"**	**Helps you understand the paper in depth with great attention to detail** • 4-5 hrs • Identify and challenge every assumption • Virtually reimplement the paper • How would you present a particular idea- restructure the article • Identify its strong and weak points

Tips to consider while reading

- Sometimes you won't understand a paper even at the end of the second pass, this maybe due to it being: new topic, unfamiliar terminology used, complex experimental technique, or simply just poorly written
- After the second pass, one could choose to continue reading or to set aside the paper and return to it later or ignore it
- The third pass is usually the reviewer level of reading, to question whether this paper can be reimplemented and is reproducible if done by someone else
- Timing between passes, the longer the better

القادة:

نواف التركي عبدالله الشهري وهى المتحمي

ريان الغنامي

الأعضاء:

عبدالله التركي عبدالله المياح رغد النظيف

محمد الزير عبدالله النجرس ريما الجريبة

عثمان الدريهم تركي العتيبي شهد البخاري

عبدالعزيز القحطاني عبدالله القرني نوف الضلعان

أثير الاحمري

ناصر الغيث عامر الغامدي وعد ابو نخاع

سعد السهلي سعد الاحمري ثراء الهويش

رائد الماضي معاذ آل صلام في الدوسري

سعود الشعلان محمد الحصيني منار الزهراني

Answer: Q1:B |Q2: D

MCQ:

Q1: which one of the following shouldn't be read while in first pass?

A. Introduction
B. Methods
C. Conclusion
D. Abstract

Q2: what is the second structure in the introduction?

A. Background Information
B. Significance of Findings
C. Hypothesis/Aim
D. Gap Analysis