

# HOW TO REVIEW A RESEARCH PAPER



This factsheet was developed by the International Association of Fire Fighters and the Firefighter Cancer Support Network.

Research papers serve as critical resources for advancing knowledge, informing decisions, and understanding key issues. Whether you are new to reading scientific studies or want to strengthen your review process, this guide will help you navigate the structure and content of research papers with confidence.

In general, when reviewing a research paper, you can focus on the following key points:

- **PURPOSE.** What is the study trying to achieve? What are the research questions?
- **METHODS.** Were the procedures appropriate and reliable to address the purpose?
- **FINDINGS.** What are the main results, and what do they mean?
- **LIMITATIONS.** Are there factors that might affect the study's conclusions?
- **RELEVANCE.** How do these findings apply to your work, interests, and decisions?



## UNDERSTANDING THE PURPOSE OF A RESEARCH PAPER

Research papers are typically structured to explore and answer specific question(s) by developing a hypothesis using evidence-based methods. They typically follow a standard format, allowing readers to extract key information and will present their approach through distinct sections, while also following requirements from publishers.

The goals of reviewing a research paper are multifaceted but primarily include identifying and understanding the question(s) researchers are asking, ensuring reliability of methodologies, being able to interpret and understand the analyses/results, and ultimately assessing practical implications.

It's also important to understand that one paper will not provide all the answers, and it is valuable to evaluate information from multiple studies to gain a better understanding of what information is available.

## GENERAL STRUCTURES OF A RESEARCH PAPER AND HOW TO EVALUATE

**ABSTRACT.** Start here. The abstract provides a concise summary of the study, including its purpose, methods, key findings, and conclusions. The abstract gives a broad snapshot of the paper, so review this first to see if the paper addresses the topic you are pursuing. If it does, the next step is to explore the full paper for context and depth.

- **Things to consider:** *Are the research questions and purpose clear? Do the findings address the study question? Is the summary representative of the study purpose? At this point, it will also be useful to skip ahead and spend time reading the discussion section or conclusion to gain a better understanding of the findings and if you want to spend more time looking at the rest of the paper.*

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**INTRODUCTION/LITERATURE REVIEW.** The introduction sets the stage by explaining the research question(s), why it matters, and what potential gaps in knowledge may exist and how the study aims to contribute to the topic. It also provides background information to help you understand the broader context of the study.

- **Things to consider:** Look and evaluate for context and clarity. Why is this study important? What hypothesis or question does it address? What information justifies the study design and research methods being conducted?

**METHODOLOGY.** This section describes how the research was conducted and incorporates details about the participants, tools, and procedures. Understanding these elements and methods is critical for evaluating whether the study was designed appropriately to answer its research question and is reliable, even when findings are what you may be expecting. Research is an ongoing process, especially in cases where something hasn't been studied extensively.

- **Things to consider:** Assess the reliability of the methods. Is the sample size adequate? Were the tools and procedures appropriate? Are there any biases or confounding factors that should be taken into consideration? Don't hesitate to reach out to subject matter experts or organizations to help you answer these questions.

**RESULTS.** The results section presents the study's findings, often using tables, graphs, and statistical summaries. While it may include complex data, it can be helpful to focus on the written explanations in order to observe and understand key trends and patterns comprehensively and see the full picture of what is being presented.

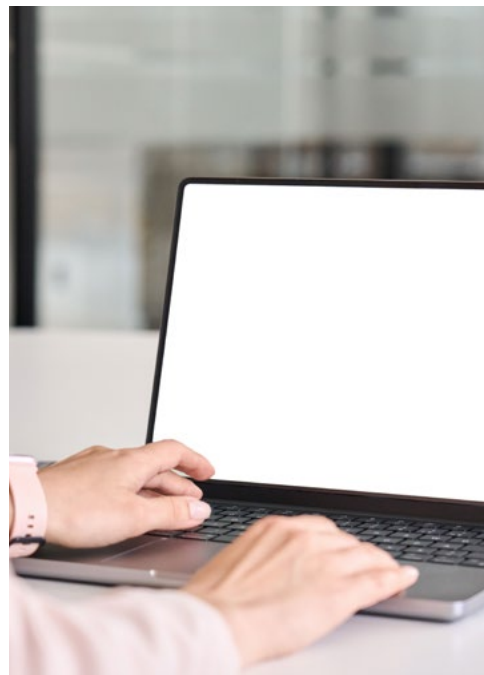
- **Things to consider:** What do the results reveal about the research question(s)? Pay attention to patterns and significant findings. The statistical analyses may be complex but utilize resources to help interpret results. Be aware that results can often represent only part of the story and try not to generalize (apply) to every situation outside of the study without thinking about how it can best be utilized.

**DISCUSSION/FUTURE DIRECTIONS.** The discussion is the opportunity for the authors to interpret their findings, connect them to prior research, and explain their significance. This section often acknowledges limitations that may impact the findings and suggest areas for future research. Furthermore, it may provide suggestions on what can be pursued next or offer recommendations for future research objectives.

- **Things to consider:** Evaluate the interpretation thoughtfully and be mindful of any biases (including your own). Do the authors explain how the findings contribute to the field? Are limitations acknowledged? How do the findings compare with other studies? Do the future directions offer meaningful connections? Is the study population comparable to the population you are looking to apply it to?

**CONCLUSION.** The conclusion will often re-cap the entire paper by summarizing the research objectives, addressing the main findings and providing suggestions on how those results have impact or implications beyond the study population and into the real world. It may also offer recommendations for those real-world situations and again will emphasize how future studies could utilize their work.

- **Things to consider:** Consider the implications. Does the conclusion summarize the key findings accurately? Are the recommendations practical and evidence-based?



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## RECOGNIZING AND EVALUATING LIMITATIONS

No study is perfect, and understanding the limitations may impact the reliability and applicability of the findings. Common limitations include small sample sizes, lack of diversity in participants, short study durations, and potential biases. Another limitation is that not all study participants will be fire fighters and therefore will not have the same exposures or risk factors outlined in the study.

When reviewing a paper, always ask: How do these limitations impact the validity of the findings? Are the limitations acknowledged by the authors? How can the limitations be addressed to better study this topic? How do these findings about specific populations potentially differ or compare to the general population or the population you are looking to apply the study to?

## FINAL POINTS

Reviewing a research paper doesn't require an advanced scientific background, but it is important to have a foundation on how to understand what the literature is presenting and how to correctly interpret the findings.

It is also important to have a clear process for evaluating not just the information, but also the authors or institutions supporting it to see if there are any biases not accounted for. Utilizing these factors and focusing on structure, purpose, and primary results or takeaways, you can confidently engage with the research landscape, apply it meaningfully to the job, and to the health and well-being of your department.