How to Read a Research Article

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Scientific Inquiry provides a forum to facilitate the ongoing process of questioning and evaluating practice, presents informed practice based on available data, and innovates new practices through research and experimental learning.

Reading a research article can be a frustrating experience for the bedside clinician who has not had much experience in the art. Yet, just like learning how to do a dressing change or administer a medication, you can learn to simplify the reading of research articles. Those who write research articles present their research in a very systematic way:

1. Identify a problem.
2. Review the previous work reported on the problem/topic area.
3. Specify what question(s) the current study addressed.
4. Describe how the study was conducted.
5. Discuss results of the study (including description of the subjects), how the data were analyzed.
6. Conclude with a discussion on interpretation of the results/findings and the implication of the findings to clinical practice.

An easy way to understand the research article is not to read the article from beginning to end but to start by identifying the conclusions of the study.

Beginning at the End

Identifying the Conclusions of the Study

To determine the conclusions, read three sections of the article: the title, the abstract, and the discussion. These sections are the most important, because they help you decide whether to read the article.

Title. The title indicates the general topic of the study. Most of the time, the title gives a very good idea of what the research study explored.

Abstract. The abstract summarizes the entire study, usually in 100 words or less. Some journals require a particular format that addresses the question, subjects, methods, results, and conclusions in separate sections. The abstract gives a very broad understanding of the content of the entire article.

Discussion. In this section the author interprets the results of the study. The meaning of the data collected and analyzed is explained, as well as how the data answer (or do not answer) the research question(s). Limitations to the study (e.g., Are there particular populations to which the results do not apply? Are there factors not part of the study design that may have influenced the outcome of the study?) and what additional research is needed also are discussed. Many research articles have an application to practice section that suggests ways in which the results can be used in everyday practice.

Sometimes the study conclusions are not found easily in the discussion section. If you cannot determine the conclusions from reading this section, read the results section of the study. Once the conclusions of the study are understood, return to the beginning and read the article as it was written.

Back to the Beginning

Introduction to the Study

The purpose of the introduction is to provide the rationale for conducting the study. This section typically starts with a discrepancy between what is current practice and what would be ideal practice. The author summarizes previous research completed in the area. Often a theoretical framework that guides the design of previous studies and the current study is described. Typically this section concludes with identification of the gaps in the literature—what has not been studied or what areas need additional research. These gaps are what stimulated the researcher to design a new study.

The identified gap often may be a broad one and too much for any single study to explore, so the researcher chooses a portion of the problem to study. For instance, a study of undermedication for pain in neonates could be designed to explore pharmacokinetics of analgesics in the neonatal period, lack of knowledge of nurses or physicians related to pain management, or validation of a new pain assessment tool.
The introduction typically concludes with a description of the particular questions (or sometimes hypotheses) that the current study addresses. If the introduction is too difficult to follow, skim it or skip most of it. Be sure to identify what questions the researcher is asking; these questions are critical to the design of the study.

In the Middle

Methods

In this section, the procedures used during the study are described. Rarely are all the details included, but there should be enough information to understand how the study was completed. Those who want to replicate the study or conduct a similar study should contact the author for more specific information.

Subjects. This section explains the candidates for participation in the study, often stating criteria for inclusion (who can be in) and exclusion (who cannot be in). Where the subjects were found (the setting) and how they were invited to participate in the study also are described.

Most research articles mention that approval for the study has been obtained from an ethics review committee, the Institutional Review Board (IRB). Members of the IRB review the study to make sure the rights of individual participants are protected. This protection includes the informed consent process that reviews what will happen during the study and the rights of the participant. The author typically reports that informed consent has been obtained.

Data collection. The characteristics, or variables, collected are described along with how the data were collected. If special equipment was used, it usually is described here. If a survey or questionnaire was used, the author may include sample questions or the entire set of questions. Practices to ensure that data were collected accurately over the course of the study are described. This might include information about training of data collectors, calibration of equipment, and reliability (same results over time) and validity (measure what it is supposed to measure) of questionnaires/surveys or tools/equipment used. The author is demonstrating that the right data were collected from the right subjects in the right manner.

At this point in the review, ask the following questions:

1. Did the researchers choose the “right” subjects?
2. Did the researchers choose the “right” variables?
3. Do the procedures used in this study make sense?
4. Was the data-collection process logical or was there too much potential for error?

Findings/Results and Data Analysis

In this section, the researchers give specifics about the collected data, starting with general information about the subjects in the study. This information is typically descriptive data, or that which describes the subjects. How many participated in the study? What are the age, gender, diagnosis, ethnicity of the participants? What other characteristics were obtained? When looking at the reported data, think back to the original number of subjects to see if the numbers are the same or if there is an explanation for why the numbers are different. The percentages of any group or category should add up to nearly 100% (99%–101% depending on rounding practices).

More complicated tests of relationships between variables will be described next. Depending on your statistics knowledge, reading these results may be daunting because of uncertainty about which statistics to use and how to use them. Novice research readers often rely on the expertise of those who reviewed the article to determine if the correct statistics were used. In general, this is a reasonable strategy because manuscript drafts usually are reviewed by two to three experts, and at least one of them should have a strong understanding of statistics. Consult a knowledgeable colleague or basic statistics book (a quick online search of booksellers’ Web sites will provide suggestions that fit your learning style) when encountering statistics that are new and/or confusing.

At the end of this section, you should have a general understanding of which results were statistically significant and which results were not. Read the discussion section again and see if the results make more sense after reading the entire article.
What Does This Article Mean to You?

Clinical Judgment

The article has been read and additional questions to be asked include:

1. Was the study worth doing? Do the results give some ideas on how to address the initial problem? Do the results give some ideas of what would and would not work in your own practice?

2. Are the conclusions reasonable and logical? Did the way the researchers examined the question make sense? Were there enough subjects to feel comfortable with the interpretation of the results?

3. Are the results useful in clinical practice? Can the findings be implemented easily?

4. Are there risks to implementing the research procedure into practice? Balance the potential benefits with potential risks.

5. Other questions? Is there information needed that the researcher did not include? Is the absent information important enough that the conclusions may be inaccurate?

Practice Your New Skill

In the beginning, reading a research article is as challenging as any other new skill you have attempted to acquire. But like any other skill, additional practice and support from those who are more experienced will strengthen your ability to read and understand research. One strategy is to develop a journal club and invite those with stronger research review skills to lead the discussion of a particular research article that the group members have read. Developing a research review form to guide your review also would be helpful (Table 1).

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Search terms: Nursing practice, research; research