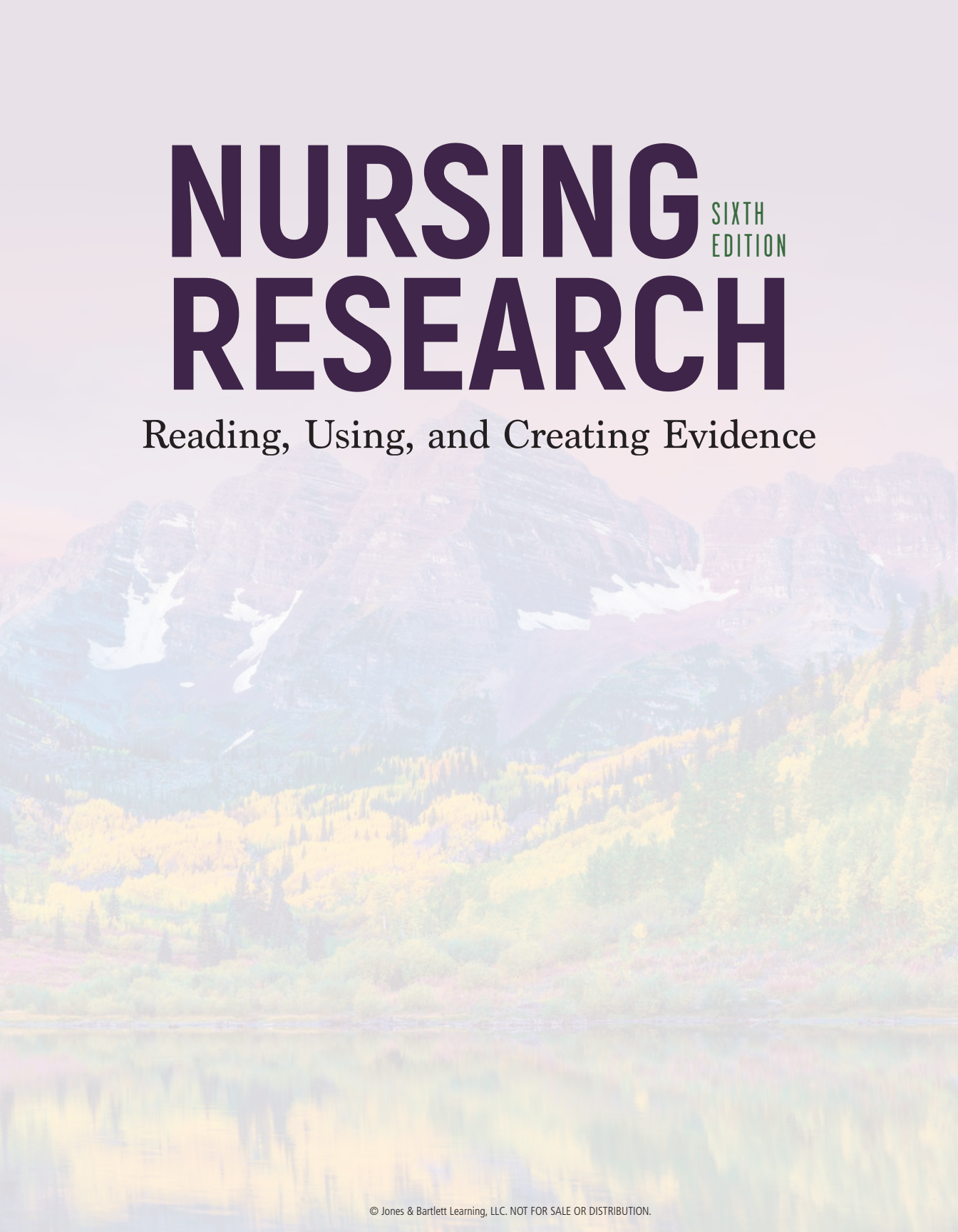
NURSING RESEARCH

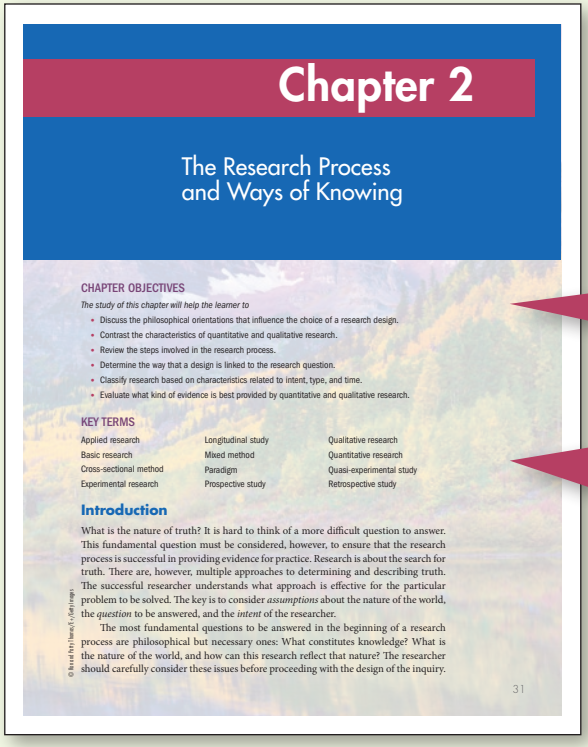
SIXTH EDITION

Reading, Using, and Creating Evidence



The Pedagogy

Nursing Research: Reading, Using, and Creating Evidence, Sixth Edition demonstrates how to use research as evidence for successful nursing practice. Fully updated and revised, this reader-friendly new edition provides students with a fundamental understanding of how to appraise and utilize research, translating it into actionable guidelines for practice. Organized around the different types of research that can be used in evidence-based practice, it addresses contemporary methods, including the use of web-based and personal device data collection, advice for culturally competent research, and suggestions for accessing hard-to-reach subjects. Additionally, it explores both quantitative and qualitative traditions and encourages students to read, use, and participate in the research process. The pedagogical aids that appear in most chapters include the following:



Chapter 2

The Research Process and Ways of Knowing

CHAPTER OBJECTIVES

The study of this chapter will help the learner to

- Discuss the philosophical orientations that influence the choice of a research design.
- Contrast the characteristics of quantitative and qualitative research.
- Review the steps involved in the research process.
- Determine the way that a design is linked to the research question.
- Classify research based on characteristics related to intent, type, and time.
- Evaluate what kind of evidence is best provided by quantitative and qualitative research.

KEY TERMS

Applied research	Longitudinal study	Qualitative research
Basic research	Mixed method	Quantitative research
Cross-sectional method	Paradigm	Quasi-experimental study
Experimental research	Prospective study	Retrospective study

Introduction

What is the nature of truth? It is hard to think of a more difficult question to answer. This fundamental question must be considered, however, to ensure that the research process is successful in providing evidence for practice. Research is about the search for truth. There are, however, multiple approaches to determining and describing truth. The successful researcher understands what approach is effective for the particular problem to be solved. The key is to consider *assumptions* about the nature of the world, the *question* to be answered, and the *intent* of the researcher.

The most fundamental questions to be answered in the beginning of a research process are philosophical but necessary ones: What constitutes knowledge? What is the nature of the world, and how can this research reflect that nature? The researcher should carefully consider these issues before proceeding with the design of the inquiry.

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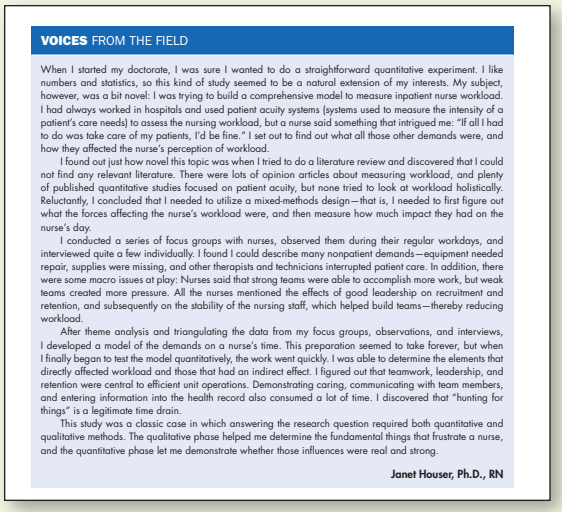
Objectives: Found at the beginning of each chapter, Chapter Objectives provide instructors and students with a snapshot of key information in each chapter. They can serve as a checklist to help guide and focus study.

Key Terms: Found at the beginning of each chapter and in bold font throughout, these terms create an expanded vocabulary in evidence-based practice.

Voices from the Field and **Scenes from the Field:** Found at the beginning of each chapter, these features share stories from practicing nurse researchers, and analyze new research for practice.



VOICES FROM THE FIELD

When I started my doctorate, I was sure I wanted to do a straightforward quantitative experiment. I like numbers and statistics, so this kind of study seemed to be a natural extension of my interests. My subject, however, was a bit novel: I was trying to build a comprehensive model to measure inpatient nurse workload. I had always worked in hospitals and used patient acuity systems (systems used to measure the intensity of a patient's care needs) to assess the nursing workload, but a nurse said something that intrigued me: "If all I had to do was take care of my patients, I'd be fine." I set out to find out what all those other demands were, and how they affected the nurse's perception of workload.

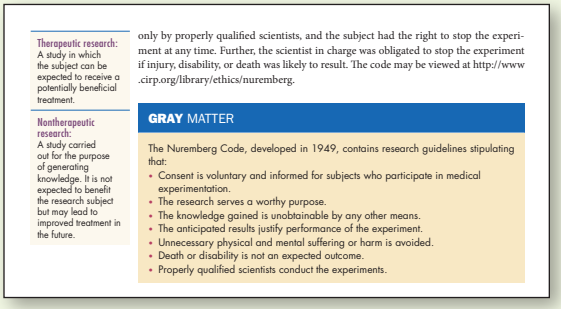
I found out just how novel this topic was when I tried to do a literature review and discovered that I could not find any relevant literature. There were lots of opinion articles about measuring workload, and plenty of published quantitative studies focused on patient acuity, but none tried to look at workload holistically. Reluctantly, I concluded that I needed to utilize a mixed-methods design—that is, I needed to first figure out what the forces affecting the nurse's workload were, and then measure how much impact they had on the nurse's day.

I conducted a series of focus groups with nurses, observed them during their regular workdays, and interviewed quite a few individually. I found I could describe many nonpatient demands—equipment needed repair, supplies were missing, and other therapists and technicians interrupted patient care. In addition, there were some macro issues at play: Nurses said that strong teams were able to accomplish more work, but weak teams created more pressure. All the nurses mentioned the effects of good leadership on recruitment and retention, and subsequently on the stability of the nursing staff, which helped build teams—thereby reducing workload.

After theme analysis and triangulating the data from my focus groups, observations, and interviews, I developed a model of the demands on a nurse's time. This preparation seemed to take forever, but when I finally began to test the model quantitatively, the work went quickly. I was able to determine the elements that directly affected workload and those that had an indirect effect. I figured out that teamwork, leadership, and retention were central to efficient unit operations. Demonstrating caring, communicating with team members, and entering information into the health record also consumed a lot of time. I discovered that "hunting for things" is a legitimate time drain.

This study was a classic case in which answering the research question required both quantitative and qualitative methods. The qualitative phase helped me determine the fundamental things that frustrate a nurse, and the quantitative phase let me demonstrate whether those influences were real and strong.

Janet Houser, Ph.D., RN



Therapeutic research: A study in which the subject can be expected to receive a potentially beneficial treatment.

Nontherapeutic research: A study carried out for the purpose of generating knowledge. It is not expected to benefit the research subject but may lead to improved treatment in the future.

only by properly qualified scientists, and the subject had the right to stop the experiment at any time. Further, the scientist in charge was obligated to stop the experiment if injury, disability, or death was likely to result. The code may be viewed at http://www.cirp.org/library/ethics/nuremberg.

GRAY MATTER

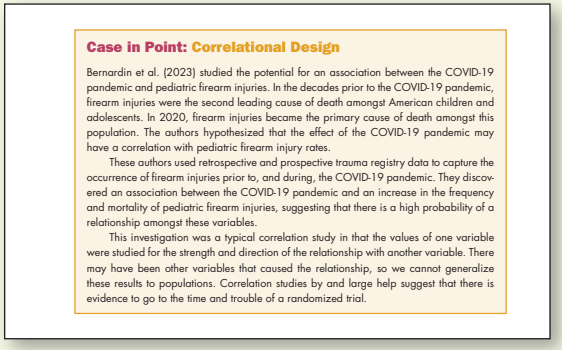
The Nuremberg Code, developed in 1949, contains research guidelines stipulating that:

- Consent is voluntary and informed for subjects who participate in medical experimentation.
- The research serves a worthy purpose.
- The knowledge gained is unobtainable by any other means.
- The anticipated results justify performance of the experiment.
- Unnecessary physical and mental suffering or harm is avoided.
- Death or disability is not an expected outcome.
- Properly qualified scientists conduct the experiments.

New Term: Found in the margins, these notes provide definitions of key terms when they first appear in the chapter.

Gray Matter: These notes cover information about key concepts for quick review.

Case in Point: Case studies expand upon concepts in the chapter and test your knowledge in real-life settings.



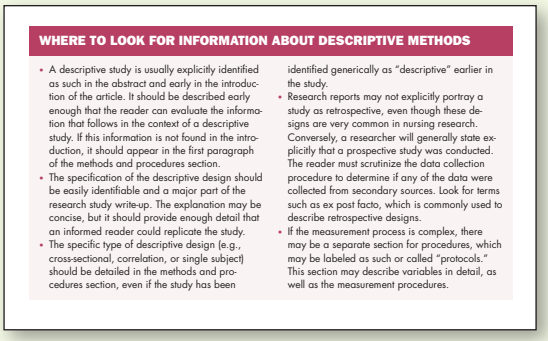
Case in Point: Correlational Design

Bernardin et al. (2023) studied the potential for an association between the COVID-19 pandemic and pediatric firearm injuries. In the decades prior to the COVID-19 pandemic, firearm injuries were the second leading cause of death amongst American children and adolescents. In 2020, firearm injuries became the primary cause of death amongst this population. The authors hypothesized that the effect of the COVID-19 pandemic may have a correlation with pediatric firearm injury rates.

These authors used retrospective and prospective trauma registry data to capture the occurrence of firearm injuries prior to, and during, the COVID-19 pandemic. They discovered an association between the COVID-19 pandemic and an increase in the frequency and mortality of pediatric firearm injuries, suggesting that there is a high probability of a relationship amongst these variables.

This investigation was a typical correlation study in that the values of one variable were studied for the strength and direction of the relationship with another variable. There may have been other variables that caused the relationship, so we cannot generalize these results to populations. Correlation studies by and large help suggest that there is evidence to go to the time and trouble of a randomized trial.

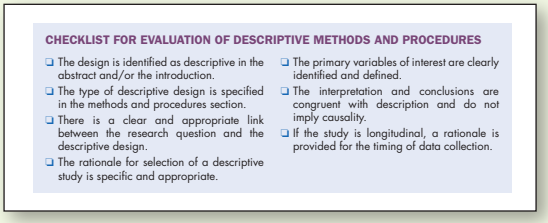
Where to Look: This feature provides guidance on where to look for key elements of a research paper, the wording that might be used to describe them, and specific things to look for during the evaluation process.



WHERE TO LOOK FOR INFORMATION ABOUT DESCRIPTIVE METHODS

- A descriptive study is usually explicitly identified as such in the abstract and early in the introduction of the article. It should be described early enough that the reader can evaluate the information that follows in the context of a descriptive study. If this information is not found in the introduction, it should appear in the first paragraph of the methods and procedures section.
- The specification of the descriptive design should be easily identifiable and a major part of the research study write-up. The explanation may be concise, but it should provide enough detail that an informed reader could replicate the study.
- The specific type of descriptive design (e.g., cross-sectional, correlation, or single subject) should be detailed in the methods and procedures section, even if the study has been identified generically as "descriptive" earlier in the study.
- Research reports may not explicitly portray a study as retrospective, even though these designs are very common in nursing research. Conversely, a researcher will generally state explicitly that a prospective study was conducted. The reader must scrutinize the data collection procedure to determine if any of the data were collected from secondary sources. Look for terms such as ex post facto, which is commonly used to describe retrospective designs.
- If the measurement process is complex, there may be a separate section for procedures, which may be labeled as such or called "protocols." This section may describe variables in detail, as well as the measurement procedures.

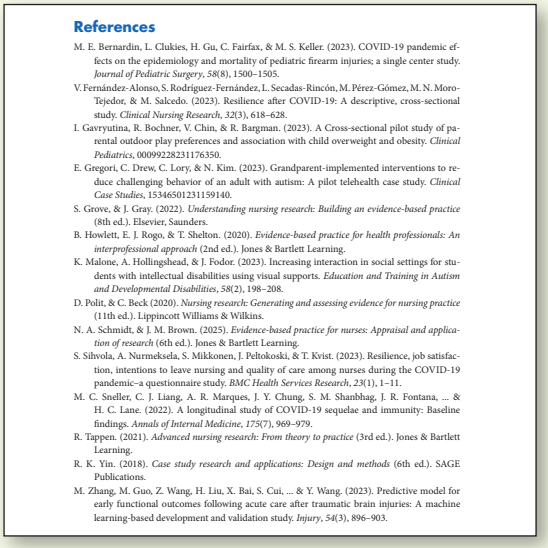
Checklist: These lists support the Where to Look feature and provide students with an evaluation of specific research activities and issues.



CHECKLIST FOR EVALUATION OF DESCRIPTIVE METHODS AND PROCEDURES

- ❑ The design is identified as descriptive in the abstract and/or the introduction.
- ❑ The type of descriptive design is specified in the methods and procedures section.
- ❑ There is a clear and appropriate link between the research question and the descriptive design.
- ❑ The rationale for selection of a descriptive study is specific and appropriate.
- ❑ The primary variables of interest are clearly identified and defined.
- ❑ The interpretation and conclusions are congruent with description and do not imply causality.
- ❑ If the study is longitudinal, a rationale is provided for the timing of data collection.

Reference Lists: Provided for a more in-depth look at the key concepts covered in all chapters.



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Summary of Key Concepts: Found at the end of each chapter, these lists compile the most pertinent concepts and information for quick review and later reference.

Summary of Key Concepts

- Inferential analysis is the analytic tool most used in quantitative studies; it enables a researcher to draw conclusions about a population given the results from a sample.
- Quantitative tests should be selected *a priori*; all identified tests should be run and reported.
- Parametric tests are appropriate for normally distributed data; otherwise, nonparametric tests should be used.
- Statistical analyses can be univariate, bivariate, or multivariate, depending on the nature and number of variables involved.
- Statistical significance indicates that a result is not due to standard error; therefore, the effect can be assumed to be real.
- Standard error is the amount of variability in the sample that is due to the sampling procedures; it is directly affected by variability and indirectly affected by sample size.
- Statistical significance should be evaluated in tandem with clinical significance, which determines the usefulness of the results as evidence for practice.
- Clinical significance can be judged by estimation, confidence intervals, minimally important difference, and effect size.
- A confidence interval is a way of reporting results so the precision and accuracy of the estimates can be evaluated as well as the size of the effect.
- Effect size is a better basis for determining clinical importance than for assessing statistical significance. It indicates the relative size of differences that can be expected under similar circumstances.
- The appropriate statistical test will consider the requirements of the research question, the number of groups to be tested, the level of measurement of variables, and the assumptions of the statistical test.
- The *z* or *t* test is appropriate for analyzing differences between means; consequently, these tests are useful when differences in interval-level variables are contrasted in two groups.
- The chi square test is appropriate for analyzing differences between proportions; consequently, it is useful when differences in a nominal- or ordinal-level variable are contrasted between two groups.
- The ANOVA test is appropriate for analyzing differences among three or more group means and is applied to avoid the error of multiple comparisons.
- Some data are so non-normal that they require tests that do not rely on a specific distribution. These tests are described as nonparametric, require large samples, and are not as sensitive as other tests.
- When reading the quantitative analysis section of a research report, the nurse should focus on the appropriateness of the statistical selection and key numbers that reflect the role of error and the amount of certainty that exists in the estimates.

Critical Appraisal Exercises: Found at the end of each chapter, these exercises direct readers to apply chapter concepts to a full-length research report.

CRITICAL APPRAISAL EXERCISE

Retrieve the following full-text article from the Cumulative Index to Nursing and Allied Health Literature or a similar search database:

Jatin, Y., Sharma, S., Singh, N., Qamar, S., Agarwal, S., Gopi, S., Gunjan, D., & Saraya, A. (2024). An open-label randomized controlled trial of early initiation of nasogastric feeding after endotherapy in variceal bleeding: A proof-of-concept study. *Journal of Clinical and Experimental Hepatology, 14*(1), 101260.

Review the article, focusing on the sections that report the results of the quantitative analyses. Think about the following appraisal questions in your critical review of this research article:

1. What group of tests would be appropriate for this research question?
2. List the variables that were measured by the researchers. For each, identify the level of measurement represented by the variable.
3. Review the demographic characteristics of the samples. Do you agree that the groups were statistically similar? Why or why not? Was each demographic variable reported with the appropriate summary statistic?
4. Which inferential test was performed to determine whether the intervention made a difference between groups? Was this the appropriate test to use? Why or why not?
5. Discuss whether the authors use tables and graphs appropriately to represent the data. How could the results reported in the tables be clearer?
6. Do the authors draw appropriate conclusions? Are the data overinterpreted, underinterpreted, or appropriately reported in the discussion and conclusion sections?

Skill Builder: Found in select chapters, this feature provides practical advice for finding research, reading it critically, and strengthening research skills.

SKILL BUILDER Write Stronger Research Questions

The most important part of the research process is getting the question right. How the problem is stated determines which measures will be used, which data will be collected, which kind of analysis will be used, and which conclusions can be drawn. It is worth the time, then, to carefully consider how this element of the research study is developed. A thoughtful process does not necessarily mean a complicated process, however. Here are some simple suggestions for creating strong research questions:

- Answer the "why" question first. With a solid understanding of the reason for the study, the specifics of the research question become easier to identify.
- Review the literature before finalizing the question. Do not hesitate to replicate the question of a research study that accomplishes similar goals. It is flattering to researchers—even established, well-known ones—to have their work replicated. Be sure to give credit where credit is due.
- Focus, focus, focus. Refine the research question, mull it over for a bit, and then refine it again. The effort spent to get the question just right will be worth it, because less confusion will arise later about how to answer the question.
- That said, do not wait until the question is perfect to begin the design of the study. The question is, to some extent, a work in progress as the specifics of the research unfold. The question can, and likely will, be revised as new information, resources, and constraints come to light.
- Keep the research questions focused; do not include more than one major concept per question. Compound questions are challenging to study and make it more difficult to isolate the effects of a single independent variable. Multiple research questions should be used instead of multiple parts of a single question.

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Preface

This nursing research text is based on the idea that research is essential for nurses as evidence for practice. Its contents are intended to be relevant for nursing students and practicing nurses who must apply evidence to practice. All nurses should be able to read research, determine how to use it appropriately in their practice, and participate in the research process in some way during their careers as professionals. This text is intended to support all these efforts.

Evidence-based practice is one of the most exciting trends in nursing practice to emerge in decades. However, its integration into daily practice requires a solid understanding of the foundations of research design, validity, and application. This text is intended as a reader-friendly approach to a complex topic so beginners can grasp the fundamentals of appraising research, experienced nurses can use research in practice, and practicing nurses can gain skills to create bedside research projects or participate effectively on research teams.

This text is presented in an uncluttered, straightforward manner. Although it uses many bulleted lists to make the material visually interesting, the sidebars, figures, and tables are limited to those that illustrate truly important concepts. This format allows the reader to grasp the information quickly and to navigate the text efficiently. Margin notes provide definitions of new terms when they first appear, and the Gray Matter features offer information about key concepts that are of particular importance.

This text differs in its approach from traditional texts in that it does not focus primarily on interpreting inferential research; rather, it seeks to impart a fundamental understanding of all types of research that may be used as evidence. It adds depth by considering the use of qualitative research in nursing practice—a natural fit with this holistic profession. This text also addresses contemporary concerns for today's nurses, including ethical and legal issues. Although both ethics and legal issues are mentioned in many research texts, a full chapter is devoted to these topics in this text so the intricacies of these issues can be thoroughly considered.

The integrated discussion of both quantitative and qualitative traditions is another unique facet of this text's coverage of the research process. Most nurse researchers have learned to appreciate the need to consider all paradigms when approaching a research question; separating the two approaches when discussing the fundamental interests of researchers results in a polarized view. Intuitively, nurses know that the lines between quantitative and qualitative designs are not always so clear in practice and they should consider multiple ways of knowing when evaluating research questions. The planning process covered here helps the novice researcher consider the requirements of both

approaches in the context of sampling, measurement, validity, and other crucial issues they share. Detailed descriptions of the procedures for each type of design are given attention in separate chapters.

The chapters are organized around the types of research processes that make up the evidence base for practice. The first section of the text provides information that is applicable to all research traditions, whether descriptive, quantitative, or qualitative. Part I provides an overview of issues relevant to all researchers: understanding the way research and practice are related, the ways knowledge is generated, and legal and ethical considerations. Part II describes the processes that go into planning research. The chapters in Part III consider the various decisions that must be made in each phase of the research process.

The evidence generated by descriptive, survey, and qualitative designs is placed in the context of both the definition of evidence-based practice and application in practice guidelines. In Parts IV, V, and VI, each major classification of research is explored in depth through review of available designs, guidelines for methods and procedures, and discussion of appropriate analytic processes. Brief examples of each type of research are provided, along with notes explaining the features demonstrated in each case in point. Finally, Part VII details the models and processes used to translate research into clinical practice.

Many chapters begin with a feature called "Voices from the Field" that relates a real-life story of a nurse's experience with the research process, illustrating the way that the material covered in that chapter might come to life. The main content for each chapter is broken into five parts:

- A thorough review of the topic under consideration is presented first. This review lays out the fundamental knowledge related to the topic.
- Next, the nurse is guided to consider the aspects of a study that should be appraised when reading research. All nurses—regardless of their experience—should be able to read research critically and apply it appropriately to practice, and the second section of each chapter addresses this skill. Added features include advice on where to look for the key elements of a research paper, the wording that might be used to describe them, and specific things to look for during the evaluation process. Evaluation checklists support this process.
- The third section of the chapter focuses on using research in practice. This section supports the nurse in determining if and how research findings might be used in their practice.
- The fourth section is intended for nurses who may be involved with teams that are charged with creating research or who may plan bedside research projects to improve practice. This section gives practical advice and direction about the design and conduct of a realistic, focused nursing research project.
- The final section of each chapter contains summary points and a critical appraisal exercise so the nurse can immediately apply the chapter concepts to a real research report.

All of these features are intended to help the reader gain a comprehensive view of the research process as it is used to provide evidence for professional nursing practice. The use of this text as a supportive resource for learning, and for ongoing reference in clinical practice, has been integrated into the design of each element of the text. The goal is to stimulate nurses to read, use, and participate in the process of improving nursing practice through the systematic use of evidence. Accomplishing this goal improves the profession for all of us.

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Writing always makes me realize how much I miss my mom, Marty, who encouraged me to publish from the time she surreptitiously sent one of my poems to *Highlights* magazine when I was 9 years old. She was proud of that poem, framed the issue, and had my grandmother embroider it on a pillow. Seeing this book in print would have impressed her only slightly more, but I know she's smiling.

Janet Houser

Collaborating on the sixth edition of *Nursing Research: Reading, Using, and Creating Evidence* has been an enriching experience, and I am grateful to those who have made this work possible. I would like to thank the team at Jones & Bartlett Learning for their support and professionalism in bringing this edition to life. I also want to acknowledge the contributors, whose expertise and insights have ensured this textbook remains a vital resource for students and professionals alike. Finally, to the nursing students, educators, and clinicians who use this textbook—thank you. I hope this edition continues to serve as a practical tool for engaging with research and improving patient care.

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Prior to her academic career, Dr. Houser spent 20 years in healthcare administration with the Mercy Health System. Her last position was as regional director for Professional Practice and Clinical Research for Mercy Health Partners in Cincinnati, Ohio, where she was responsible for professional practice and clinical research in 29 facilities.

Dr. Houser has published seven books; *Clinical Research in Practice: A Guide for the Bedside Scientist*; *Nursing Research: Reading, Using, and Creating Evidence*, which is in its sixth edition; and *Evidence-Based Practice: An Implementation Guide*. She has more than 30 peer-reviewed publications in journals and has presented her research at regional, national, and international conferences.

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