ESSENTIALS OF
Nursing Research

APPRAISING EVIDENCE FOR NURSING PRACTICE

Tenth Edition

Denise F. Polit
Cheryl Tatano Beck

Wolters Kluwer

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TO

Our families and friends

The heroes on the front lines of health care

Those who are working to address social and health inequities

ABOUT THE AUTHORS

Denise F. Polit, PhD, FAAN

Denise F. Polit, PhD, FAAN, is an American health care researcher who is recognized internationally as an authority on research methods, statistics, and measurement. She received her Bachelor's degree from Wellesley College and her PhD from Boston College. She is the president of a research consulting company, Humanalysis, Inc., in Saratoga Springs, New York, and an adjunct professor at Griffith University, Brisbane, Australia. She has published in numerous journals and has written several award-winning textbooks, including a groundbreaking book on measurement in health, *Measurement and the Measurement of Change: A Primer for the Health Professions*, and a book on statistical analysis, *Statistics and Data Analysis for Nursing Research*. Her research methods books with Dr. Cheryl Tatano Beck have been translated into French, Spanish, Portuguese, German, Chinese, and Japanese. She has been invited to give lectures and presentations in many countries, including Australia, India, Ireland, Denmark, Norway, South Africa, Turkey, Sweden, and the Philippines.

Denise has lived in Saratoga Springs for 33 years and is active in the community. She has assisted numerous nonprofit organizations in designing surveys and analyzing survey data. Currently, she serves on the board of directors of the Saratoga Foundation and the New Leaf

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Over the past 35 years, Cheryl has focused her research efforts on developing a research program on postpartum mood and anxiety disorders. Based on the findings from her series of qualitative studies, Cheryl developed the Postpartum Depression Screening Scale (PDSS), which is published by Western Psychological Services. She is a prolific writer who has published over 150 journal articles. In addition to coauthoring award-winning research methods books with Denise Polit, Cheryl coauthored with Dr. Jeanne Driscoll *Postpartum Mood and Anxiety Disorders: A Clinician's Guide*, which received the 2006 *American Journal of Nursing* Book of the Year Award. In addition, Cheryl has published five other books: *Traumatic Childbirth*, *Routledge International Handbook of Qualitative Nursing Research*, *Developing a Program of Research in Nursing*, *Secondary Qualitative Analysis in the Health and Social Sciences*, and *Introduction to Phenomenology: Focus on Methodology*.

PREFACE

Essentials of Nursing Research, 10th edition, helps students learn how to read and critically appraise research reports and to develop an appreciation of research as a path to enhancing nursing practice.

We continue to enjoy updating this book with important innovations in research methods and with examples of nurse researchers' use of emerging research strategies. Feedback from our loyal adopters has inspired several important changes to the content and organization of this book. We are convinced that these revisions introduce important improvements—while at the same time retaining many features that have made this book a classic best-selling textbook throughout the world. The 10th edition of this book, its study guide, and its online resources will make it easier and more satisfying for nurses to pursue a professional pathway that incorporates thoughtful appraisals of evidence.

LEGACY OF *ESSENTIALS OF NURSING RESEARCH*

This edition, like its predecessors, is focused on the art—and science—of critically appraising studies conducted by nurses and other health care professionals. The textbook offers guidance to students who are learning to assess research reports and to use research findings in practice.

Among the basic principles that helped to shape this and earlier editions of this book are the following:

1. Confidence in the idea that competence in doing and appraising research is critical to the nursing profession
2. A conviction that research inquiry is intellectually and professionally rewarding to nurses
3. An unswerving belief that learning about research methods need be neither intimidating nor dull

Consistent with these principles, we have tried to present research fundamentals in a way that both facilitates understanding and arouses curiosity and interest. We hope that, for some, it will arouse passion for the pursuit of research-based knowledge to guide practice.

NEW TO THIS EDITION

New Organization

A lot has happened in the world of research since the ninth edition. A particularly salient issue is patient (and other stakeholder) involvement in identifying important questions and translating research evidence into local settings. Relatedly, standard methods of appraising evidence for the **rigor** of study methods (which has been a focus of evidence-based practice, or EBP, initiatives) are being supplemented by a new emphasis on the **relevance** and **applicability** of research evidence for individual patients or small groups of patients (as espoused by the movement for **practice-based evidence** and **patient-centered research**). This new perspective led us to reorganize the content on EBP. In this edition, basic EBP concepts are woven into Chapter 1 (rather than Chapter 2). Evidence-based practice and practice-based evidence are given broader attention in the final chapter of the book, Chapter 18. We believe that this new organization will better facilitate the use of research evidence in nursing practice.

Manageable Text for One-Semester Course

We have streamlined the text even further in this edition to make it more manageable for use in a one-semester course. We reduced the length by organizing content differently and by keeping essential information in the text while moving background/advanced content to online supplements.

Enhanced Accessibility

To make this edition even more user-friendly than in the past, we have made a concerted effort to simplify the presentation of complex topics. For example, we reduced and simplified the coverage of statistical information. In addition, throughout the book we have used more straightforward, concise language.

New Content

New ideas and concepts have been threaded throughout this 10th edition. In addition to updating the book with new information on conventional research methods and recent examples of nursing studies, we have added content on the following topics:

- **Quality improvement (QI)** projects play an increasingly important role in the practice of most health care professionals. In this edition, we describe how QI projects are distinct from research studies and how they can be undertaken with rigor. The expanded content on quality improvement is found in Chapter 12.
- **Clinical significance** is a seldom mentioned but important topic that has gained prominence among researchers in other health care fields that has only recently gained traction among nurse researchers. Expanded coverage on this topic is found in Chapter 14.

- **Comparative effectiveness research (CER)**, which emphasizes patient centeredness, is an important manifestation of emerging directions in health care research. CER is discussed in Chapters 12 and 18.
- **Systematic reviews** serve as critical sources of state-of-the-art evidence for health care practitioners. We have expanded the coverage of this topic (Chapter 17) and have introduced the **GRADE system** for evaluating reviewers' confidence in the review's conclusions.

THE TEXT

The content of this edition is as follows:

- **Part 1, Overview of Nursing Research and Its Role in Evidence-Based Practice**, introduces fundamental concepts in nursing research. Chapter 1 summarizes the background of nursing research, discusses the philosophical underpinnings of qualitative research versus quantitative research, describes major purposes of nursing research, and introduces key concepts relating to evidence-based practice. Chapter 2 introduces readers to key research terms and presents an overview of steps in the research process for both quantitative and qualitative studies. Chapter 3 focuses on research journal articles, explaining what they are and how to read them. Chapter 4 discusses ethics in nursing studies.
- **Part 2, Preliminary Steps in Quantitative and Qualitative Research**, further sets the stage for learning about the research process by considering aspects of a study's conceptualization. Chapter 5 focuses on the development of research questions and the formulation of research hypotheses. Chapter 6 discusses how to retrieve research evidence (especially in electronic bibliographic databases) and the role of research literature reviews. Chapter 7 presents information about theoretical and conceptual frameworks for nursing studies.
- **Part 3, Designs and Methods for Quantitative and Qualitative Nursing Research**, presents material on the design and conduct of all types of nursing studies. Chapter 8 describes fundamental design principles and discusses many specific aspects of quantitative research design, including efforts to enhance rigor. Chapter 9 introduces the topics of sampling and data collection in quantitative studies. Concepts relating to quality in measurements—reliability and validity—are introduced in this chapter. Chapter 10 describes the various qualitative research traditions that have contributed to the growth of constructivist inquiry and presents the basics of qualitative design. Chapter 11 covers sampling and data collection methods used in qualitative research, describing how these differ from approaches used in quantitative studies. Chapter 12 provides an overview of several distinctive types of research, with a special emphasis on mixed methods research. This chapter also discusses other special types of research such as surveys, comparative effectiveness studies, evaluation research, and outcomes research. Methods of undertaking quality improvement projects are also described.

- **Part 4, Analysis, Interpretation, and Application of Nursing Research**, presents tools for making sense of—and using—research data. Chapter 13 reviews methods of statistical analysis. The chapter assumes no prior instruction in statistics and focuses primarily on helping readers to understand why statistics are useful, what test might be appropriate in a given situation, and what statistical information in a research article means. Chapter 14 discusses approaches to interpreting statistical results, including interpretations linked to assessments of clinical significance. Chapter 15 discusses qualitative analysis, with an emphasis on ethnographic, phenomenologic, and grounded theory studies. In this edition, we offer an expanded discussion of the coding of qualitative data. Chapter 16 elaborates on criteria for appraising trustworthiness and integrity in qualitative studies. Chapter 17 describes systematic reviews, including how to understand and appraise meta-analyses and metasyntheses—and how the GRADE system works in the context of systematic reviews. Finally, Chapter 18 describes key steps in evidence-based practice and also explains emerging ideas about how to improve EBP by striving for evidence that is more practice-based and patient-centered—that is, how to enhance the applicability of evidence to individual patients or well-defined subgroups of patients.
- At the end of the book, we offer students additional support for critical appraisal. **In the appendices, we offer full-length research articles—**two quantitative, one qualitative, and one mixed methods—that students can read, analyze, and appraise. Some of the Critical Thinking Exercises in each chapter focus on these four studies. We also have included our critical appraisal of one of these studies (the one in Appendix D), which can be used as a model. A **glossary** at the end of the book provides additional support for those needing to look up the meaning of a methodologic term.

FEATURES OF THE TEXT

We have retained many of the classic features that were successfully used in previous editions to assist those learning to read and apply evidence from nursing research:

- **Clear, User-Friendly Style.** Our writing style is easily digestible and nonintimidating—and we have worked even harder in this edition to write clearly and simply. Concepts are introduced carefully, difficult ideas are presented thoughtfully, and readers are assumed to have no prior knowledge of technical terms.
- **Critical Appraisal Guidelines.** Each chapter includes guidelines for conducting a critical appraisal of various aspects of a research report. The guidelines sections provide a list of questions that walk students through a study, drawing attention to aspects of the study that are amenable to evaluation by research consumers.
- **Research Examples and Critical Thinking Exercises.** Each chapter concludes with summaries of one or two research examples designed to highlight important points made in the chapter and to sharpen the reader's critical thinking skills. In addition, many research examples are used to illustrate key points in the text and to stimulate students' thinking about areas of research inquiry. We have chosen many international examples to

communicate to students that nursing research is growing in importance worldwide. Some of the Critical Thinking Exercises focus on the full-length articles in the four appendices.

- **Tips for Students.** The textbook is filled with practical guidance and tips on how to translate the abstract notions of research methods into more concrete applications. In these tips, we have paid special attention to helping students *read* research reports, which are often daunting to those without specialized research training.
- **Graphics.** Colorful graphics—in the form of supportive tables, figures, and examples—reinforce the text and offer visual stimulation.
- **Chapter Objectives.** Learning objectives are identified in the chapter opener to focus students' attention on critical content.
- **Key Terms.** Each chapter opener includes a list of new research terms. In the text, new terms are defined in context (and bolded) when used for the first time; terms of lesser importance are italicized. Key terms are also defined in our glossary.
- **Bulleted Summary Points.** A succinct list of summary points that focus on salient chapter content is provided at the end of each chapter.

A COMPREHENSIVE PACKAGE FOR TEACHING AND LEARNING

To further facilitate teaching and learning, a carefully designed ancillary package has been developed to assist faculty and students.

Resources for Instructors

Tools to assist with teaching this text are available upon its adoption on thePoint® at http://thePoint.lww.com/PolitEssentials10e.

- NEW! **Test Generator Questions** are completely new and written by the book's authors for the 10th edition. Hundreds of multiple-choice questions aid instructors in assessing their students' understanding of the chapter content.
- **An Instructor's Manual** offers guidance to improve the teaching experience. We have recognized the need for strong support for instructors in teaching a course that can be quite challenging. Part of the difficulty stems from students' anxiety about the course content and their concern that research methods might not be relevant to their nursing practice. We offer numerous suggestions on how to make learning about—and teaching—research methods more rewarding. The contents of the Instructor's Manual include the following for each chapter:
  - **Statement of Intent.** Discover the authors' goals for each chapter.
  - **Special Class Projects.** Find numerous ideas for interesting and meaningful class projects. Check out the icebreakers and activities relating to the Great Cookie Experiment and "How Do You Feel" icebreakers.

- **Test Questions and Answers.** True/false questions, plus important application questions, test students' comprehension and their ability to put their new appraisal skills to use. The application questions focus on a brief summary of a study and include several short-answer questions (with our answers), plus essay questions. These application questions are intended to assess students' knowledge about methodologic concepts and their critical appraisal skills.
- **Answers to Critical Thinking Exercises.** These are provided for selected questions related to the stud-ies in the appendices of the textbook.

- **Two sets of PowerPoint Slides:**
  - **"Test Yourself!" PowerPoint Slides.** For each chapter, a slide set of five multiple-choice "Test Yourself!" questions relating to key concepts in the chapter are followed by answers to the questions. (A few chapters have two sets of "Test Yourself!" slides.) The aim of these slides is not to evaluate student performance. We recommend these slides be given to students for self-testing, or they can be used in the classroom with iClicker to assess students' grasp of important concepts. To enhance the likelihood that students will see the relevance of the concepts to clinical practice, all the questions are application-type questions. We hope instructors will use the slides to clarify any misunderstandings and, just as importantly, to reward students with immediate positive feedback about newly acquired skills.
  - **PowerPoint Presentations** offer traditional summaries of key points in each chapter for use in class presentations. These slides are available in a format that permits easy adaptation and also include audience response questions that can be used on their own or are compatible with iClicker and other audience response programs and devices.
- **An Image Bank** includes figures from the text.
- **A Sample Syllabus** is provided for a 14-week course.
- **A QSEN Map** shows how the book content integrates QSEN competencies.
- **A BSN Essentials Competencies Map** shows how the book content integrates American Association of Colleges of Nursing (AACN) Essentials of Baccalaureate Education for Professional Nursing Practice competencies.
- **Learning Management System Course Cartridges.**
- **Access to all student resources previously discussed.**

Resources for Students

An exciting set of resources is available to help students review material and become even more familiar with vital concepts. Students can access all these resources on thePoint® at http://thePoint.lww.com/PolitEssentials10e, using the codes printed on the inside front cover of their textbooks.

- **Supplements for Each Chapter** further students' exploration of specific topics. A full list of the supplements appears on page xx. These supplements can be assigned to provide

additional background or to offer advanced material to meet students' specific needs.

- **Hundreds of Student Review Questions** help students to identify areas of strength and areas needing further study.
- **Answers to Critical Thinking Exercises** are provided for selected questions related to the studies in the appendices of the textbook.
- **Journal Articles**—18 full articles from Wolters Kluwer journals (one corresponding to each chapter)—are provided for additional critical appraisal opportunities. Some of these are the full journal articles for studies used as the end-of-chapter Research Examples. All journal articles that appear on are identified in the text with and are called out in the References lists for appropriate chapters with a double asterisk (**).
- **Internet Resources with relevant and useful websites** related to chapter content can be clicked on directly without having to retype the URL and risk a typographical error. This edition also includes **links to all open-access articles cited in the textbook;** these articles are called out in the References lists for appropriate chapters with a single asterisk (*).
- **Critical Appraisal Guidelines** and **Learning Objectives** from the textbook are available in Microsoft Word for students' convenience.

STUDY GUIDE

The accompanying ***Study Guide for Essentials of Nursing Research***, 10th edition, is available for separate purchase and augments the text, providing students with opportunities to apply their learning.

- **Critical appraisal opportunities** abound in the *Study Guide*, **which includes eight research articles in their entirety**. The studies represent a range of nursing topics and research approaches, including a randomized controlled trial, a correlational/mixed methods study, an EBP project, two qualitative studies (ethnographic and grounded theory studies), a quality improvement project, a meta-analysis, and a metasynthesis. The **Application Exercises** in each chapter guide students in reading, understanding, and appraising these eight studies.
- Answers to the "Questions of Fact" section in the Application Exercises in each chapter are presented in Appendix I of the *Study Guide* so that students can get immediate feedback about their responses.
- Although critical appraisal skills are emphasized in the *Study Guide*, other included activities support students' learning of fundamental research terms and principles, such as fill-in-the-blank exercises, matching exercises, and focused study questions. Answers to those questions that have an objective answer are provided in Appendix I.

A COMPREHENSIVE, DIGITAL, INTEGRATED COURSE SOLUTION: LIPPINCOTT® COURSEPOINT

The same trusted solution, innovation, and unmatched support that you have come to expect from *Lippincott CoursePoint* is now enhanced with more engaging learning tools and deeper analytics to help prepare students for practice. This powerfully integrated, digital learning solution combines learning tools, case studies, real-time data, and the most trusted nursing education content on the market to make curriculum-wide learning more efficient and to meet students where they're at in their learning. The solution connects learning to real-life application by integrating content from *Essentials of Nursing Research* with video cases, interactive modules, and research journal articles. Ideal for active, case-based learning, this powerful solution helps students develop higher level cognitive skills and asks them to make decisions related to simple-to-complex scenarios. And now, it's easier than ever for instructors and students to use, giving them everything they need for course and curriculum success! To learn more about this solution, contact your local Wolters Kluwer representative.

Lippincott CoursePoint for Polit & Beck: Essentials of Nursing Research, 10th edition includes the following:

- **Leading Content in Context**, with digital content from *Essentials of Nursing Research*, 10th edition, is embedded in our powerful tools, engaging students and encouraging interaction and learning on a deeper level.
  - The complete interactive e-book provides students with anytime, anywhere access on multiple devices.
  - Full online access to *Stedman's Medical Dictionary for the Health Professions and Nursing* ensures students work with the best medical dictionary available.
- Engaging course content provides a variety of learning tools to engage students of all learning styles.
- A more **personalized learning approach** gives students the content and tools they need at the moment they need it, giving them data for more focused remediation and helping to boost their confidence and competence.
- **Powerful tools** help students learn the critical thinking and clinical judgment skills to help them become practice-ready nurses, including the following:
  - **Video Cases** show how nursing research and evidence-based practice relate to real-life nursing practice. By watching the videos and completing related activities, students will flex their nursing research skills and build a spirit of inquiry.

- **Interactive Modules** help students quickly identify what they do and do not understand, so they can study smartly. With exceptional instructional design that prompts students to discover, reflect, synthesize, and apply, students actively learn. Remediation links to the digital textbook are integrated throughout.
- Unparalleled reporting provides in-depth dashboards with several data points to track student progress and help identify strengths and weaknesses.
- Unmatched support includes training coaches, product trainers, and nursing education consultants to help educators and students implement CoursePoint with ease.

CLOSING NOTE

It is our hope and expectation that the content, style, and organization of this 10th edition of *Essentials of Nursing Research* will be helpful to those students who want to become skillful, thoughtful readers of nursing studies and to those wishing to enhance their clinical performance based on research findings. We also hope that this textbook will help to develop an enthusiasm for the kinds of discoveries and knowledge that research can produce.

Denise F. Polit, PhD, FAAN
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USER'S GUIDE

Learning Objectives focus students' attention on critical content

Key Terms alert students to important terminology

Examples help students apply content to real-life research

Tip boxes describe what is found in actual research articles

How-to-Tell Tip boxes explain confusing issues in actual research articles

Learning Objectives

On completing this chapter, you will be able to:

- Describe the logic of sampling for qualitative studies
- Identify and describe several types of sampling approaches in qualitative studies
- Evaluate the appropriateness of the sampling method and sample size used in a qualitative study
- Identify and describe methods of collecting unstructured self-report data
- Identify and describe methods of collecting and recording unstructured observational data
- Critically appraise a qualitative researcher's decisions regarding the data collection plan
- Define new terms in the chapter

Key Terms

- Data saturation
- Diary
- Field notes
- Focus group interview
- Key informant
- Log
- Maximum variation sampling
- Participant observation
- Photo elicitation
- Photovoice
- Purposive (purposeful) sampling
- Semi-structured interview
- Snowball sampling
- Theoretical sampling
- Topic guide
- Unstructured interview

Example of a convergent design

Kalanlar and Kuru Alici (2020) used a convergent design to study the effect of care burden on formal caregivers' quality of work life. Structured questionnaires were used to obtain quantitative data about the key constructs. In-depth interviews were also undertaken with some caregivers, who were asked such questions as, "What are the most challenging situations while giving care?" and "How does your care burden affect your home life?"

TIP When a quantitative study is based on a theory or model, the research article typically states this fact early—often in the abstract or the title. Some reports also have a subsection of the introduction called "Theoretical Framework." The report usually includes a brief overview of the theory so that all readers can understand, in a broad way, the conceptual context of the study.

HOW-TO-TELL TIP How can you tell if a study is experimental? Researchers usually indicate in the method section of their reports that they used an experimental or randomized design (RCT). If such terms are missing, you can conclude that a study is experimental if the article says that the study purpose was to *test the effects of* an intervention AND if participants were put into groups at random.

Critical Appraisal Guidelines boxes lead students through key issues in a research article →

Box 9.1 Guidelines for Critically Appraising Quantitative Sampling Plans

1. Was the population identified? Were eligibility criteria specified?
2. What type of sampling design was used? Was the sampling plan one that could be expected to yield a representative sample?
3. How many participants were in the sample? Was the sample size affected by high rates of refusals or attrition? Was the sample size large enough to support statistical conclusion validity? Was the sample size justified on the basis of a power analysis or other rationale?
4. Were key characteristics of the sample described (e.g., mean age, percentage of female)?
5. To whom can the study results reasonably be generalized?

Research Examples highlight critical points made in the chapter and sharpen critical thinking skills →

RESEARCH EXAMPLES WITH CRITICAL THINKING EXERCISES

This section presents an example of a study that described its theoretical links. Read the summary and then answer the critical thinking questions, referring to the full research report if necessary. Answers to the questions for Exercise 1 are available to instructors on thePoint®. The critical thinking questions for Exercises 2 and 3 are based on the studies that appear in their entirety in Appendices A and B of this book. Our comments for these exercises are in the Student Resources section on thePoint®.

EXAMPLE 1: SOCIAL COGNITIVE THEORY IN A QUANTITATIVE STUDY

Study: Predicting engagement with online walking promotion among metropolitan and rural cancer survivors (Frensham et al., 2020)

Statement of Purpose: The purpose of the study was to evaluate the effectiveness of a 12-week online intervention (Steps Toward Improving Diet and Exercise or STRIDE) that was designed to promote walking and other health-promoting behaviors among cancer survivors living in rural and urban areas of Australia.

Critical Thinking Exercises provide opportunities to practice critically appraising research articles →

Critical Thinking Exercises

1. Answer the relevant questions from Box 7.1 regarding this study.
2. Also consider the following targeted question: Is there another model or theory that was described in this chapter that could have been used to study the effect of this intervention?
3. If the results of this study are valid and generalizable, what might be some of the uses to which the findings could be put in clinical practice?

Summary Points review chapter content to ensure success →

Special icons alert students to important content found on thePoint® and in the accompanying Study

Summary Points

- A **research problem** is a perplexing or troubling situation that a researcher wants to address through disciplined inquiry.
- Researchers usually identify a broad *topic*, narrow the scope of the problem, and then identify research questions consistent with a paradigm of choice.
- Researchers communicate their aims in research articles as problem statements, statements of purpose, research questions, or hypotheses.
- A **problem statement** articulates the problem and an *argument* that explains the need for a study. Problem statements typically include several components: problem identification; background, scope, and consequences of the problem; knowledge gaps; and possible so-

concepts (variables) and the study group or population. Purpose statements often communicate, through the choice of verbs and other key terms, aspects of the study design, or the research tradition.

- **Research questions** are the specific queries researchers want to answer in addressing the research problem.
- A **hypothesis** states predicted relationships between two or more variables—that is, the anticipated association between independent and dependent variables.
- **Directional hypotheses** predict the direction of a relationship; **nondirectional hypotheses** predict the existence of relationships, not their direction.
- **Research hypotheses** predict the existence of relationships; **null hypotheses**, which express the absence of relationships, are the hypotheses subjected to statistical testing.
- Hypotheses are never proved or disproved—

accompanying Study Guide

tutions to the problem.

- A **statement of purpose,** which summarizes the overall study goal, identifies the key

they are accepted or rejected, supported or not supported by the data.

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ACKNOWLEDGMENTS

This 10th edition, like the previous nine editions, depended on the contribution of many generous people. To all of the many faculty and students who used the text and have made invaluable suggestions for its improvement, we are very grateful. Suggestions were made to us both directly in personal interactions (mostly at the University of Connecticut and Griffith University in Australia) and via e-mail correspondence. We would like in particular to thank Valori Banfi, nursing librarian at the University of Connecticut, and Carrie Morgan Eaton, a faculty member at the University of Connecticut.

Other individuals made specific contributions. Although it would be impossible to mention all, we note with thanks the nurse researchers who shared their work with us as we developed examples, including work that in some cases was not yet published. We also extend our warm thanks to those who helped to turn the manuscript into a finished product. The staff at Wolters Kluwer has been of tremendous assistance in the support they have given us over the years. We are indebted to Michael Kerns, Meredith L. Brittain, Barton Dudlick, and all the others behind the scenes for their fine contributions.

Finally, we thank our families, our loved ones, and our friends, who provided ongoing support and encouragement throughout this endeavor and who were tolerant when we worked long into the night, over weekends, and during holidays to get this 10th edition finished.

CONTENTS

Part I Overview of Nursing Research and Its Role in Evidence-Based Practice

Part 3 Designs and Methods for Quantitative and Qualitative Nursing Research

Chapter Supplements Available on thePoint

PART 1

Overview of Nursing Research and Its Role in Evidence-Based Practice

1 Overview of Nursing Research and Its Role in Evidence-Based Practice

Learning Objectives

On completing this chapter, you will be able to:

- Describe why research is important in nursing and discuss the importance of evidence-based practice
- Describe broad historical trends and future directions in nursing research
- Describe alternative sources of evidence for nursing practice
- Describe major characteristics of the positivist and constructivist paradigm and discuss similarities and differences between the traditional scientific method (quantitative research) and constructivist methods (qualitative research)
- Identify several purposes of qualitative and quantitative nursing research
- Understand sources of information for evidence-based practice
- Describe evidence hierarchies and level of evidence scales
- Identify a well-worded clinical question for evidence-based practice
- Define new terms in the chapter

Key Terms

- Applicability
- Assumption
- Cause-probing research
- Clinical nursing research
- Clinical significance
- Constructivist paradigm
- Empirical evidence
- Evidence-based practice
- Evidence hierarchy
- Generalizability
- Journal club
- Level of evidence scale
- Meta-aggregation
- Meta-analysis
- Metasynthesis
- Mixed methods research
- Mixed studies review
- Nursing research
- Paradigm
- Patient centeredness
- PICO format
- Positivist paradigm
- Primary study
- Qualitative research
- Quantitative research
- Research
- Research methods
- Scientific method
- Systematic review

NURSING RESEARCH IN PERSPECTIVE

We know that most readers are not reading this book because they plan to become nurse researchers. Yet, we are confident that many of you *will* participate in research-related activities during your careers, and virtually all of you will be expected to be research-savvy at a basic level. We hope that you will come to see the value of nursing research and will be inspired by the efforts of the thousands of nurse researchers now working worldwide to improve patient care. You are embarking on a lifelong voyage in which research will play a role. We hope to help you enjoy the journey.

What Is Nursing Research?

Research is systematic inquiry that relies on disciplined methods to answer questions and solve problems. The ultimate goal of research is to gain knowledge that can benefit many people. **Nursing research** is systematic inquiry designed to develop evidence about issues of importance to nurses and their clients. Nurses undertake research to address problems relating to nursing education and nursing administration, but in this book, we emphasize **clinical nursing research**—that is, research designed to guide nursing practice and to improve the health and quality of life of nurses' clients. Clinical nursing research typically begins with questions stemming from practice problems—problems you may have already encountered.

Examples of nursing research questions

- Does a massage intervention reduce post-operative pain in infants with complex congenital heart disease? (Harrison et al., 2020)
- What is it like to cope with the fear of cancer recurrence among ovarian cancer survivors? (Galica et al., 2020)

TIP You may think that research is too abstract to have a bearing on patient care. But nursing research focuses on *real* people with *real* problems, and studying those problems offers opportunities to address them through improvements to nursing care.

The Importance of Research to Evidence-Based Nursing

Nursing has experienced profound changes in the past few decades. Nurses are increasingly expected to understand research and to base their practice on evidence from research—that is, to adopt an **evidence-based practice (EBP)**. EBP involves using the best evidence in making patient care decisions, and such evidence typically comes from research conducted by nurses and other health care professionals. Nurse leaders recognize the need to base specific nursing decisions on evidence indicating that the decisions are clinically appropriate, resulting in positive client outcomes, as well as cost-effective. We discuss EBP in greater detail later in this chapter.

In some countries, research plays a role in nursing credentialing and status. For example, the American Nurses Credentialing Center—an arm of the American Nurses Association—has developed a Magnet Recognition Program to recognize health care organizations that provide high-quality nursing care. To achieve Magnet status, practice environments must demonstrate a sustained commitment to EBP; the 2019 Magnet application manual incorporated revisions that strengthen evidence-based requirements. Changes to nursing practice are happening every day because of EBP efforts.

Example of evidence-based practice

Many clinical practice changes reflect the impact of research. For example, "kangaroo care," the holding of diaper-clad preterm infants skin to skin, chest to chest by parents, is now widely practiced in neonatal intensive care units (NICUs), but before 2000, only a minority of NICUs offered kangaroo care options. Expanded adoption of this practice resulted from mounting evidence that early skin-to-skin contact has clinical benefits without negative side effects. Some of that evidence came from rigorous studies conducted by nurse researchers (e.g., Bastani et al., 2017; Billner-Garcia et al., 2018; Cho et al., 2016; Lowson et al., 2015; Xie et al., 2020).

Roles of Nurses in Research

Most nurses are likely to engage in one or more activity along a continuum of research participation. At one end of the continuum are *consumers of nursing research*—nurses who read research reports to keep up-to-date on findings that may affect their practice. EBP depends on well-informed nursing research consumers.

At the other end of the continuum are the *producers of nursing research*—nurses who actively undertake studies. Research is increasingly being conducted by practicing nurses who want to find what works best for their clients.

Between these two end points on the continuum lie a variety of research activities in which nurses engage. Even if you never carry out a study, you may do one of the following:

1. Contribute an idea for a study.
2. Gather information from those taking part in a study.
3. Advise clients about participating in a study.
4. Search for research evidence to address a practice problem.
5. Discuss the implications of a study in a **journal club** in your practice setting, which involves meetings (in groups or online) to discuss research articles.

In all these possible research-related activities, nurses who have some research skills are better able than those without them to make a contribution to nursing and to EBP.

Nursing Research: Past and Present

Most people agree that research in nursing began with Florence Nightingale in the 1850s. Based on her skillful analysis of factors affecting soldier mortality and morbidity during the Crimean War, she was successful in bringing about changes in nursing care and in public health. After Nightingale's work, however, research disappeared from the nursing literature until the early 1900s, but most studies at that time concerned nurses' education.

In the 1950s, research by nurses began to accelerate. Increased numbers of nurses with advanced degrees, the growth in research funding, and the establishment of the journal *Nursing Research* helped to propel nursing research at mid-20th century. During the 1960s, practice-oriented research began to emerge, and research-oriented journals started publication in several countries. During the 1970s, there was a change in research emphasis from areas such as teaching and nurses' characteristics to improvements in client care. Nurses also began to pay attention to the utilization of research findings in nursing practice.

In 1986, the National Center for Nursing Research (NCNR) was established at the National Institutes of Health (NIH) in the United States. A key purpose of NCNR was to promote and financially support research relating to patient care. In 1993, nursing research was strengthened when NCNR was promoted to full institute status within the NIH: The *National Institute of Nursing Research* (NINR) was created. NINR

helped put nursing research into the mainstream of activities enjoyed by other health disciplines. Funding opportunities for nursing research also expanded in other countries. The 1990s witnessed the birth of several more journals for nurse researchers.

TIP For those interested in learning more about the history of nursing research, we offer an expanded summary in the supplement to this chapter on thePoint® website.

Current and Future Directions for Nursing Research

Nursing research continues to develop at a rapid pace and will undoubtedly flourish throughout the 21st century as research findings grow. In 1986, NCNR had a budget of $16 million, whereas NINR funding in fiscal year 2020 was approximately $170 million. Among the trends we foresee for the near future are the following:

- *Continued focus on EBP*. Nurses' use of research findings in their practice will continue to be encouraged. This means that improvements will be needed in nurses' skills in locating, understanding, critically appraising, and using relevant study results.
- *Ongoing growth of research syntheses*. Systematic reviews, which are a cornerstone of EBP, rigorously integrate research information on a topic so that conclusions about the state of evidence can be reached.
- *Increased emphasis on patient centeredness*. **Patient centeredness** has become a central concern in health care and in research. Efforts are increasing to ensure that research is relevant to patients and that patients play a role in setting research priorities.
- *Relatedly, greater interest in the **applicability** of research*. More attention is being paid to figuring out how study results can be applied to individual patients or subgroups of patients. A limitation of the current EBP model is that evidence typically is based on the *average effects* of health care interventions implemented under ideal circumstances.
- *Expanded local research and quality improvement efforts in health care settings*. Small studies designed to solve local problems are increasing. This trend will be reinforced as more hospitals apply for (and are recertified for) Magnet status in the United States and other countries. Mechanisms are being developed to ensure that evidence from local projects becomes available to others facing similar problems.
- *Increased focus on health disparities*. Health disparities continue to be a crucially important concern, and this in turn has raised consciousness about the cultural sensitivity of health interventions. Research (and health care more generally) must be sensitive to the beliefs, life experiences, barriers, and values of racially, culturally, and linguistically diverse populations.
- *Growing interest in defining and ascertaining **clinical significance***. Research findings increasingly must meet the test of being clinically significant, and patients have taken center stage in efforts to define clinical significance.

What are nurse researchers likely to be studying in the future? Although there is tremendous diversity in research interests, research priorities have been articulated by NINR, Sigma Theta Tau International, and other nursing organizations. For example, the primary areas of interest articulated in the 2016 NINR strategic plan were the following:

- Symptom science: promoting personalized health strategies
- Wellness: promoting health and preventing disease
- Self-management: improving quality of life for individuals with chronic illness
- End-of-life and palliative care: the science of compassion

TIP All websites cited in this chapter, plus additional websites with useful content relating to the foundations of nursing research, are in the Internet Resources on thePoint® website. This will allow you to simply use the "Control/Click" feature to go directly to the website, without having to type in the URL and risk a typographical error. Websites corresponding to the content of all chapters of the book are on thePoint®.

KNOWLEDGE SOURCES FOR NURSING PRACTICE

Nurses make clinical decisions based on a large repertoire of knowledge. As a nursing student, you are gaining skills in nursing practice from your instructors, textbooks, and clinical placements. When you become a registered nurse (RN), you will continue to learn from other nurses and health care professionals. Because evidence is constantly evolving, learning about best-practice nursing will be an ongoing quest throughout your career.

Some of what you have learned thus far is based on systematic research, but much of it is not. Where does knowledge for nursing practice come from? Until fairly recently, knowledge was based primarily on clinical experience, trial and error, tradition, and expert opinion. These alternative sources of knowledge are different from research-based information.

Tradition and "Experts"

Some nursing decisions are based on untested traditions and "unit culture" rather than on sound evidence. One analysis suggested that some "sacred cows" (ineffective customs) persist even in a health care center recognized as a leader in EBP (Hanrahan et al., 2015). Another common source of knowledge is an authority, a person with specialized expertise. Reliance on experts (such as nursing faculty, mentors, or textbook authors) is unavoidable. Experts, however, are not infallible—particularly if their expertise is based primarily on personal experience or outdated information; yet, their knowledge is often unchallenged.

TIP The consequences of *not* using research-based evidence can be devastating. For example, from 1956 through the 1980s, Dr. Benjamin Spock published several editions of *Baby and Child Care*, a parental guide that sold over 19 million copies worldwide. Dr. Spock wrote the following advice: "I think it is preferable to accustom a baby to sleeping on his stomach from the beginning if he is willing" (Spock, 1979, p. 164). Research has demonstrated that this sleeping position is associated with heightened risk of sudden infant death syndrome (SIDS). In their systematic review of evidence, Gilbert and colleagues (2005) wrote, "Advice to put infants to sleep on the front for nearly half a century was contrary to evidence from 1970 that this was likely to be harmful" (p. 874). They estimated that if medical advice had been guided by research evidence, over 60,000 infant deaths might have been prevented.

Clinical Experience and Trial and Error

Clinical experience is a functional source of knowledge—indeed, it is a component of the EBP model. Yet, personal experience has limitations as a source of evidence for practice because each nurse's experience is too narrow to be generally useful, and personal experiences are often colored by biases. Trial and error—alternatives tried successively until a solution to a problem is found—can be practical but the method tends to be haphazard and solutions may be idiosyncratic.

Disciplined Research

Disciplined research is considered the best method of acquiring reliable knowledge. Evidence-based health care compels nurses to base their clinical practice to the extent possible on rigorous research-based findings rather than on tradition, authority, or personal experience—although nursing will always remain a rich blend of art and science.

PARADIGMS AND METHODS FOR NURSING RESEARCH

The questions that nurse researchers ask, and the strategies they use to answer their questions, spring from a researcher's view of how the world "works." In research parlance, a **paradigm** is a worldview, a general perspective on the world's complexities.

Disciplined inquiry in nursing has been conducted mainly within two paradigms. The paradigm that dominated nursing research for decades is called the **positivist paradigm**. Positivism, rooted in 19th century thought, is a reflection of a broad cultural movement that emphasizes the rational and scientific. The **constructivist paradigm** (sometimes called the *naturalistic paradigm*) began as a countermovement to positivism and is a major alternative system for conducting research in nursing.

This section describes the two paradigms and outlines the research methods associated with them. **Research methods** are the techniques researchers use to structure a study and to gather and analyze relevant information. The two paradigms are associated with different methods of developing evidence.

The Positivist Paradigm

An **assumption** is a principle that is believed to be true without verification. Paradigms are associated with a set of assumptions that have implications for the kinds of research questions that researchers ask and the methods they use to answer them.

Worldview of the Positivist Paradigm

A fundamental assumption of positivists is that there is a reality *out there* that can be studied and known. Positivists assume that nature is ordered and regular, and that a reality exists independent of human observation. The assumption of *determinism* refers to the positivists' belief that phenomena are not haphazard but rather have antecedent causes. Within the positivist paradigm, research activity is often aimed at understanding the underlying causes of natural phenomena. Because of their belief in a factual reality, positivists prize objectivity. Their approach involves the use of orderly, disciplined procedures with tight controls over the research situation to test hunches about the nature of phenomena being studied and relationships among them.

TIP What do we mean by *phenomena*? In a research context, *phenomena* are those things in which researchers are interested—such as a health event (e.g., a patient fall), a health outcome (e.g., pain), or a health experience (e.g., living with chronic pain).

Strict positivist thinking has been challenged. *Postpositivists* recognize the impossibility of total objectivity, but they view objectivity as a goal and strive to be as unbiased as possible. Postpositivists also appreciate the barriers to knowing reality with certainty and therefore seek *probabilistic* evidence—i.e., learning what the true state of a phenomenon *probably* is. This modified positivist position remains a dominant force in nursing research. For the sake of simplicity, we refer to it as positivism.

The Scientific Method and Quantitative Research

The traditional, positivist **scientific method** involves using orderly procedures to gather primarily quantitative information. Quantitative researchers typically move in a systematic fashion from the definition of a problem to a solution. By *systematic*, we mean that investigators progress through a series of steps, according to a prespecified plan. Quantitative researchers use methods designed to control the research situation with the goal of minimizing *bias* and maximizing validity.

Quantitative researchers gather **empirical evidence**—evidence that is rooted in objective reality and gathered through the senses rather than through personal beliefs. Evidence for a study using the traditional scientific method is gathered systematically, using instruments to collect needed information. Usually, the information is *quantitative*—numeric information that results from some type of formal measurement and that is analyzed statistically. Quantitative researchers strive to go beyond the specifics of a situation; the ability to generalize research findings to individuals who did not take part in the study (referred to as **generalizability**) is an important goal.

The traditional scientific method has been used productively by nurse researchers studying a wide range of questions. Yet, there are important limitations. For example, quantitative researchers must deal with problems of *measurement*. To study a phenomenon, scientists must measure it, that is, attach numeric values that express quantity. For example, if the phenomenon of interest were patient stress, researchers would want to assess if stress was high or low, or higher under certain conditions. Physiologic phenomena like blood pressure and temperature can be measured with accuracy and precision, but the same cannot be said of psychological phenomena, such as stress, resilience, or pain.

Nursing research focuses on human beings, who are inherently complicated and diverse. Quantitative studies typically focus on only a few concepts (e.g., weight gain, depression). Complexities tend to be controlled and, if possible, eliminated rather than studied directly, and this narrowness of focus can sometimes obscure insights. Quantitative research within the positivist paradigm has been criticized for failing to capture the full breadth of human experience.

Example of a quantitative study

Tung and colleagues (2020) examined the effect of meridian cuffing exercises on functional fitness and cardiopulmonary functioning in community-dwelling older adults. The researchers measured such outcomes as upper body flexibility, handgrip strength, lung capacity, and aerobic endurance among people who either did or did not receive the exercise intervention.

TIP Students often find quantitative studies more intimidating than qualitative ones. Try not to worry too much about the jargon at first—remember that each study has a *story* to tell, and grasping the main point of the story is what is initially important.

The Constructivist Paradigm

This section describes the assumptions and research methods associated with the constructivist paradigm.

Worldview of the Constructivist Paradigm

For the naturalistic inquirer, reality is not a fixed entity but rather a construction of the people participating in the research; reality exists within a context, and many constructions are possible. Constructivists take the position of relativism: If there are multiple interpretations of reality that exist in people's minds, then there is no process by which the ultimate truth or falsity of the constructions can be determined.

The constructivist paradigm assumes that knowledge is maximized when the distance between the inquirer and participants in the study is minimized. The voices and interpretations of those under study are crucial to understanding the phenomenon of interest, and subjective interactions are the best way to access them. Findings from a constructivist inquiry are the product of the interaction between the inquirer and the participants.

Constructivist Methods and Qualitative Research

Researchers in the constructivist versus the positivist paradigm rely on different research methods (Table 1.1). Researchers in constructivist traditions emphasize the inherent complexity of humans, their ability to shape their own experiences, and the idea that truth is a composite of realities. Consequently, constructivist studies are focused on understanding the human experience as it is lived, through the careful collection and analysis of *qualitative* materials that are narrative and subjective.

TABLE 1.1 Key Methodologic Differences in the Positivist and Constructivist Paradigms

Positivist Paradigm (Quantitative Research)	Constructivist Paradigm (Qualitative Research)
Deductive processes → hypothesis testing	Inductive processes → hypothesis generation
Emphasis on discrete, specific concepts	Emphasis on the entirety of a phenomenon; holistic
Focus on the objective and quantifiable	Focus on the subjective and nonquantifiable
Outsider knowledge—researcher is external, separate	Insider knowledge—researcher is part of the process
Fixed, prespecified research design	Flexible, emergent research design
Controls over context	Context-bound
Large, representative samples	Small, information-rich samples
Measured (quantitative) information	Narrative (unstructured) information
Statistical analysis	Qualitative analysis
Seeks generalizations	Seeks in-depth understanding

Qualitative researchers believe that a major limitation of the traditional scientific method is that it is *reductionist*—that is, it reduces human experience to the few concepts under investigation, and those concepts are defined in advance rather than emerging from the experiences of

those under study. Constructivist researchers tend to emphasize the dynamic, holistic, and individual aspects of human life and try to capture those aspects in their entirety, within the context of those who are experiencing them.

Flexible, evolving procedures are used to capitalize on findings that emerge during the study, which typically is undertaken in naturalistic settings. The collection and analysis of information usually progress concurrently. As researchers sift through information, insights are gained, new questions emerge, and further evidence is sought to confirm the insights. Through an inductive process (going from specifics to the general), researchers integrate information to develop a theory or description that illuminates the phenomena under observation.

Constructivist studies yield rich, in-depth information that can potentially clarify the dimensions of a complicated phenomenon. The findings are grounded in the real-life experiences of people with firsthand knowledge of a phenomenon. Nevertheless, the approach has several limitations. Human beings are used directly as the instrument through which information is gathered, and humans are highly intelligent—but fallible—tools.

Another issue involves the subjectivity of constructivist inquiry, which can raise concerns about the idiosyncratic nature of the judgments. Would two constructivist researchers studying the same phenomenon in similar settings arrive at comparable conclusions? The problem is exacerbated by the fact that most constructivist studies involve a small number of participants. Thus, the generalizability of findings from constructivist inquiries is a potential concern.

Example of a qualitative study

Drageset and colleagues (2020) conducted an in-depth study to explore breast cancer survivors' coping experiences 9 years after they had primary breast cancer surgery.

TIP Researchers seldom discuss or even mention the underlying paradigm of their studies in their reports. The paradigm shapes the inquiry without being explicitly referenced.

Multiple Paradigms and Nursing Research

Paradigms are lenses that help to sharpen researchers' focus on phenomena of interest. The availability of alternative paradigms for studying nursing problems can maximize the breadth of new evidence for practice. Nursing is enriched by the use of diverse methods—methods that are often complementary in their strengths and limitations.

We have emphasized differences between the two paradigms and associated methods so that distinctions would be easy to understand. It is equally important, however, to note that the two paradigms have many features in common, some of which are mentioned here:

- *Ultimate goals*. The ultimate aim of disciplined research, regardless of paradigm, is to answer questions and solve problems. All researchers seek to capture the truth with regard to the phenomena in which they are interested.
- *External evidence*. The word *empiricism* is often associated with the scientific method, but qualitative researchers also gather and analyze evidence gathered empirically, that is, through their senses.
- *Reliance on human cooperation*. Human cooperation is essential in both qualitative and quantitative research. To understand people's characteristics and experiences, researchers must persuade them to participate in the study and to speak candidly.
- *Ethical constraints*. Regardless of paradigms or methods, research with human beings is guided by ethical principles that sometimes conflict with research goals.
- *Fallibility*. Virtually, all studies have limitations. The fallibility of any single study makes it important to understand and critically appraise researchers' methods when evaluating evidence quality.

Thus, despite philosophic and methodologic differences, researchers using the traditional scientific or constructivist methods face many similar challenges. The selection of an appropriate method depends not only on researchers' worldview but also on the research question. If a researcher asks, "What are the effects of cryotherapy on oral mucositis in patients undergoing chemotherapy?" the researcher needs to examine effects through a careful quantitative assessment of patient outcomes. On the other hand, if a researcher asks, "What is the process by which parents learn to cope with the death of a child?" the researcher would be hard pressed to quantify the process. Personal worldviews of researchers help to shape the questions they ask.

In reading about the alternative paradigms, you likely were more attracted to one of the two paradigms—the one that corresponds to your view of the world. It is important, however, to learn about and value both approaches to disciplined inquiry and to recognize their respective strengths and limitations. This book will hopefully help you to become *methodologically bilingual*—a skill that is increasingly important because many nurse researchers are now undertaking **mixed methods research** that involves the collection and analysis of both qualitative and quantitative data in a single study, as we discuss in Chapter 12.

HOW-TO-TELL TIP How can you quickly tell if a study is qualitative or quantitative? As you progress through this book, you should be able to identify most studies as qualitative versus quantitative based on terms in the introductory summary or on the report title. At this point, though, it may be easiest to distinguish the two types of studies based on how many *numbers* appear in the article, especially in tables. Qualitative studies may have no tables with quantitative information, or only one numeric table describing participants' characteristics (e.g., the percentage who were male or female). Quantitative studies typically have several tables with numbers and statistical information. Qualitative studies often have "word tables" or diagrams and figures illustrating processes inferred from the narrative information gathered.

THE PURPOSES OF NURSING RESEARCH

Why do nurses do research? Several systems have been devised to classify research goals.

Research for Varying Levels of Explanation

One classification system concerns the extent to which studies provide explanatory information. The descriptive/explanatory continuum includes studies whose purposes are identification, description, exploration, prediction/control, and explanation of health-related phenomena. For each purpose, various types of question are addressed—some more amenable to qualitative than to quantitative inquiry, and vice versa. Here are some examples of questions researchers ask related to these purposes, with a designation of whether the inquiry would most likely be quantitative (Quan) or qualitative (Qual):

- *Identification*: What is this phenomenon? What is its name? (Qual)
- *Description*: How prevalent is the phenomenon? (Quan) What are the dimensions or characteristics of the phenomenon? (Qual)
- *Exploration*: What factors are related to the phenomenon? (Quan) What is the full nature of the phenomenon? (Qual)
- *Prediction/control*: If phenomenon X occurs, will phenomenon Y follow? Can the phenomenon be prevented? (Quan)
- *Explanation*: What is the underlying cause of the phenomenon? (Quan) What does the phenomenon mean? (Qual)

TIP Specific study goals can range along a descriptive/explanatory continuum, but a fundamental distinction is between studies whose primary intent is to *describe* phenomena and those that are **cause-probing**—i.e., designed to illuminate the underlying causes of phenomena. Questions in the prediction/control and explanation categories are cause-probing.

Research Purposes Linked to Evidence-Based Practice

Another system for classifying studies has emerged in efforts to communicate EBP-related purposes (e.g., Guyatt et al., 2015; Melnyk & Fineout-Overholt, 2019). In this classification scheme, most purposes can best be addressed with quantitative research.

Therapy/Intervention

Therapy/intervention questions are addressed by health care researchers who want to learn the benefits of specific actions, treatments, products, or processes. Studies with a therapy purpose seek to identify effective treatments for ameliorating or preventing health problems. Such studies range from evaluations of highly specific treatments (e.g., comparing two types of cooling blankets for febrile patients) to complex multicomponent interventions designed to result in behavioral changes (e.g., testing a nurse-led smoking cessation intervention). Therapy questions are foundational for evidence-based decision making; evidence for changes to nursing practice comes from studies that have tested the effects of intervening in a particular way.

Example of a study aimed at Therapy

Is an Avatar application effective in teaching heart attack recognition and response in patients with acute coronary syndrome (Tongpeth et al., 2020)?

Diagnosis and Assessment

Many nursing studies concern the rigorous development and testing of formal instruments to screen, diagnose, and assess patients and to measure clinical outcomes—that is, they address **Diagnosis/assessment questions**. High-quality instruments with documented accuracy are essential for clinical practice and for research.

Example of a study aimed at Diagnosis/assessment

Resnick and colleagues (2020) developed and rigorously evaluated the Checklist for Function-Focused Care in Service Plans, using data from 242 people living in assisted living facilities. The checklist was designed to assess whether service plans were helping to optimize physical activity and function.

Prognosis

Researchers who ask **Prognosis questions** strive to understand the outcomes associated with a disease or a health problem (i.e., its consequences), to estimate the probability they will occur, and to predict the types of people for whom the outcomes are most likely. Such studies facilitate the development of long-term care plans for patients. They also provide valuable information for guiding patients to make beneficial lifestyle choices or to be vigilant for key symptoms.

Example of a study aimed at Prognosis

Yoo and colleagues (2020) studied the effect of physical function limitations in patients with end-stage renal disease on 1-year kidney transplant outcomes (graft success and patient survival).

Etiology (Causation)/Prevention of Harm

It is difficult to prevent harm or treat health problems if we do not know what causes them—and this is the focus of **Etiology questions**. For example, there would be no smoking cessation programs if research had not provided firm evidence that smoking cigarettes causes or contributes to many health problems. Thus, determining the factors and exposures that affect or cause illness, mortality, or morbidity is an important purpose of many studies.

Example of a study aimed at Etiology/prevention of harm

Tang and coresearchers (2020) did a study to identify factors associated with reductions in functional status among older intensive care unit (ICU) survivors who were discharged 6 months earlier. The risk factors included delirium, impaired mobility while in the ICU, and use of mechanical ventilation during the ICU stay.

Description

Description questions are not in a category typically identified in EBP-related classification schemes, but so many nursing studies have a descriptive purpose that we include it here. Examples of phenomena that nurse researchers have described include patients' pain, physical function, confusion, and levels of depression. Quantitative description focuses on the prevalence, size, intensity, and measurable attributes of phenomena. Qualitative researchers, by contrast, describe the dimensions or the evolution of phenomena.

Example of a quantitative study aimed at Description

Porter and coresearchers (2020) did a study to describe Code Blue activations in a regional Australian health care service. They found, for example, that activation was highest on Tuesdays (19%) and that the emergency department was the most common clinical setting for a Code Blue event (28%). About half the patients (49%) survived the activations.

Example of a qualitative study aimed at Description

Niela-Vilen and colleagues (2020) undertook a study to describe the perspectives of both health care professionals and pregnant women with high-risk pregnancies regarding remote monitoring in maternity care versus being a "Google mom."

Meaning and Processes

Many health care activities (e.g., motivating people to comply with treatments, designing appealing interventions) can benefit from gaining insight into the clients' perspectives, using qualitative research methods that address **Meaning/process questions**. Research that offers evidence about what health and illness mean to clients, what barriers they face to positive health practices, and what processes they experience in a transition through a health care crisis are important to evidence-based nursing practice.

Example of a study aimed at Meaning/process

Neris and colleagues (2020) studied the experiences and journey of self-discovery throughout the urologic cancer survival trajectory of men in Brazil.

TIP Several EBP-related purposes involve *cause-probing* research. Therapy/intervention research focuses on whether an intervention *causes* improvements in key outcomes. Prognosis research examines whether a disease or health condition *causes* subsequent adverse consequences. Etiology research seeks explanations about the underlying *causes* of health problems.

Links Between Study Purposes and Evidence-Based Practice

Studies that address Therapy/intervention questions provide the most direct evidence for EBP. If we want to know, for example, whether wedge-shaped foam cushions are more effective in preventing heel pressure ulcers than standard foam pillows, we would need to look for rigorous studies that have addressed this Therapy question.

Other questions also play a role in improving the quality of nursing care, albeit in different ways. Table 1.2 presents examples of different questions relating to cigarette smoking, using the EBP-related purpose categories. The findings from studies relating to only one of these questions is directly *actionable*—the Therapy question. If there is good evidence that nurse-led smoking cessation programs are effective in reducing smoking among young adults, we might consider initiating such a program in our own community.

TABLE 1.2 Different Categories of Question Relating to Cigarette Smoking

Type of Question	Example of a Research Question on Cigarette Smoking
Therapy/intervention	Does a nurse-led smoking cessation program for young adults reduce smoking?
Diagnosis/assessment	Is our Smoking Susceptibility Index a valid and reliable measure of teenagers' propensity to initiate smoking?
Prognosis	Is a diagnosis of smoking-related lung cancer associated with increased risk of suicidal ideation?
Etiology (causation)/prevention of harm	Does being a smoker increase the risk of a fatality among people infected with the novel coronavirus?
Description	What percentage of high school students smoke ≥1 pack of cigarettes per week?
Meaning/process	What is it like for long-term smokers to attempt and fail at quitting?

Strong evidence from studies addressing the other questions in Table 1.2 could also guide efforts to improve nursing practice—but not as directly. For example, evidence about suicide ideation from the Prognosis question might prompt us to develop a program of emotional support for patients with lung cancer. Results from the Etiology study might lead us to launch a smoking-cessation initiative in communities hit hard by coronavirus infections. The stories from long-term smokers who failed to quit despite efforts to do so (the Meaning question) could lead us to involve them in the design of an intervention for persistent smokers.

Nurse researchers are making strides in addressing all types of questions about important health problems—but evidence regarding what "works" to improve nursing practice comes from studies addressing Therapy questions. Evidence about the scope of a problem, factors affecting the problem, the consequences of the problem, and the meaning of the problem can, however, play a crucial role in efforts to design better interventions, to aim resources at those in greatest need, and to provide appropriate guidance to clients in everyday practice.

BASICS OF EVIDENCE-BASED NURSING PRACTICE

In this section, we describe some basic principles of EBP. We elaborate on EBP issues in Chapter 18.

Definition of Evidence-Based Practice

Dozens of definitions of EBP have been proposed. Most definitions describe EBP as a *decision-making* (or *problem-solving*) *process*. Most definitions also include the idea that EBP is built on a "three-legged stool," each "leg" of which is essential to the process: *best evidence*, *patient preferences and values*, and *clinical expertise*. Figure 1.1 depicts these concepts.

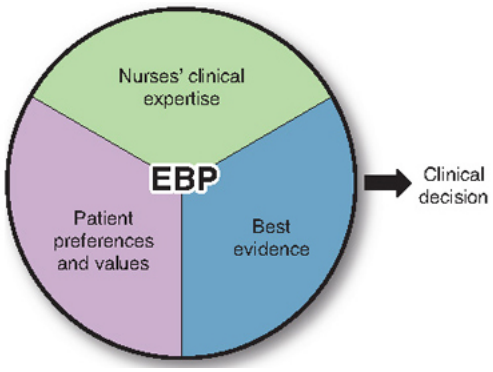

Figure 1.1 Model of evidence-based nursing practice.

Best Evidence

A basic feature of EBP as a clinical problem-solving strategy is that it de-emphasizes decisions based on tradition or expert opinion. The emphasis is on identifying and evaluating the best available research evidence as a tool for solving problems. There continues to be debate about what qualifies as "best" evidence. As we discuss in the next section, evidence is often evaluated in relation to *evidence hierarchies* that rank evidence sources according to the degree to which the evidence is unbiased. Evidence, however, whether "best" or not, is never by itself a sufficient basis for clinical decision making.

Patient Preferences and Values

Patient input encompasses several concepts, including patient preferences for type of treatment, preferences for being involved in decision making, social or cultural values, preferences about involving family members in health care decisions, priorities regarding quality of life

issues, and spiritual or religious values. EBP decisions also require understanding patients' circumstances, such as the resources at their disposal. Nurses thus need the skills to elicit and understand patient preferences and their situations.

Nurses' Clinical Expertise

Decision making in clinical practice also relies on clinicians' expertise, which is an amalgam of academic knowledge gained during training and continuing education, experiences with patient care, and interdisciplinary sharing of new knowledge. David Sackett, the pioneer of evidence-based medicine, strongly advocated for the importance of clinical expertise in making decisions because even very strong research evidence is seldom appropriate for all patients.

Sources of "Best" Research Evidence

Thousands of studies of relevance to nurses are published every month in professional journals. **Primary studies** must be critically appraised to determine if the evidence is sufficiently rigorous to warrant consideration in nursing practice. Finding evidence useful for practice is often facilitated by the availability of evidence that is preprocessed (synthesized) and sometimes pre-appraised. For example, several evidence-based journals publish synopses of original research (e.g., *Evidence-Based Nursing*, *The Online Journal of Knowledge Synthesis for Nursing*), and the synopses are occasionally accompanied by commentary about the clinical utility of the evidence.

Syntheses that integrate evidence from multiple studies on a given topic are an especially important resource for EBP. The most widely respected type of synthesis is the systematic review. A **systematic review** is not just a literature review—it is a methodical, scholarly inquiry that summarizes and evaluates current evidence on a research question. Systematic reviews are the basis for most clinical practice guidelines.

Systematic reviewers sometimes integrate findings from quantitative studies using statistical methods, in what is called a **meta-analysis**. Meta-analysts treat the findings from a study as one piece of information. The findings from multiple studies on the same topic are combined and analyzed statistically. Meta-analysis is an objective method of integrating a body of findings and of observing patterns that might otherwise have gone undetected (see Chapter 17).

Systematic reviews of qualitative studies often take the form of metasyntheses. A **metasynthesis** is less about combining information and more about amplifying and interpreting it. For certain qualitative questions, an aggregative (rather than interpretive) approach to systematic synthesis called **meta-aggregation** may be appropriate. Strategies have also been developed for systematic **mixed studies review**, which are efforts to integrate and synthesize both quantitative and qualitative evidence on a topic.

Evidence Hierarchies and Level of Evidence Scales

Judgments about what evidence is "best" are often guided by evidence hierarchies. **Evidence hierarchies** rank evidence sources in terms of their risk of bias, focusing mainly on risk of bias in studies addressing Therapy questions. Most evidence hierarchies are represented as pyramids, with the highest ranking sources—those presumed to have the least bias for making inferences about the effects of an intervention—at the top. The hierarchies form **level of evidence (LOE) scales** that rank order types of evidence. Level I evidence usually is considered the best (least biased) type of evidence.

Figure 1.2 shows our eight-level evidence hierarchy for Therapy/intervention questions. In our scheme, the Level I evidence source is a systematic review of studies called *randomized controlled trials* (RCTs), which are the "gold standard" type of study for Therapy questions. An individual RCT is a Level II evidence source. Going down the "rungs" of the evidence hierarchy for Therapy questions results in evidence with a higher risk of bias in answering questions about "what works." (Technical terms in Figure 1.2, such as "quasi-experiment," are explained later in the book.)

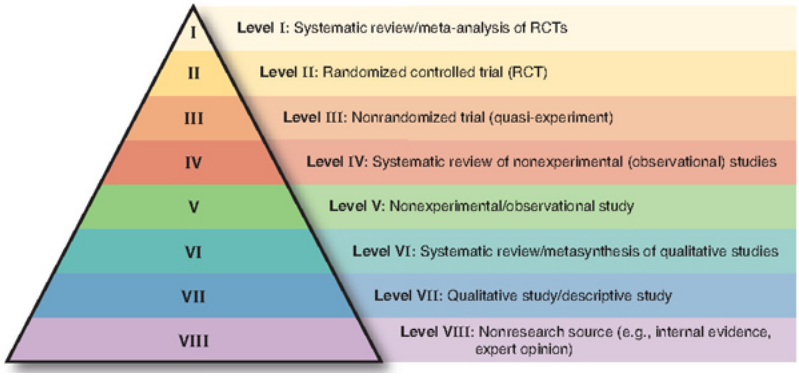

Figure 1.2 Polit–Beck Evidence Hierarchy/Level of Evidence Scale for Therapy questions.

TIP Sometimes, evidence hierarchies are used to "level" or grade evidence sources, with the implication that higher levels provide better quality evidence. As pointed out by Levin (2014), however, an evidence hierarchy "is not meant to provide a quality rating for evidence retrieved in the search for an answer" (p. 6). She noted that "leveling" a study is not a substitute for a critical appraisal of the evidence.

Asking Well-Worded Clinical Questions for Evidence-Based Practice

In Chapter 18, we describe a five-step process for putting research to use in clinical settings—the "5A" process: Ask, Acquire, Appraise, Apply, and Assess. Here, we focus on the first step.

The first activity in EBP involves asking well-worded clinical questions that can be answered with research evidence. For example, we may wonder, "Is a fish oil–enhanced nutritional supplement effective in stabilizing weight in cancer patients with cachexia?" The answer to such a Therapy question may provide "best evidence" on how to address the needs of patients with cachexia.

Most guidance for EBP uses the acronyms PIO and **PICO** to help practitioners develop well-worded questions. In the PICO form, the clinical question is worded to identify four components:

P: the *Population* or *patients* (What are key characteristics of the patients or people?)
I: the *Intervention*, *influence*, or *exposure* (What is the intervention or therapy of interest? or, What is a potentially beneficial—or harmful—influence?)
C: an explicit *Comparison* to the "I" component (With what is the intervention or influence being compared?)
O: the *Outcome* (What is the outcome in which we are interested?)

Applying this scheme to our question about cachexia, our *population* (P) is cancer patients with cachexia; the *intervention* (I) is fish oil–enhanced nutritional supplements; and the *outcome* (O) is weight stabilization. In this question, the *comparison* is not formally stated, but the implied "C" is the *absence* of fish oil–enhanced supplements—the question is in a PIO format. However, when there is an explicit comparison of interest, the full PICO format is used. For example, we might be interested in learning whether fish oil–enhanced supplements (I) are better than melatonin (C) in stabilizing weight (O) in patients with cachexia (P).

For questions that can best be answered with qualitative information (e.g., about the meaning of an experience or health problem), two components are most relevant:

The *population* (What are the characteristics of the patients or clients?)
The *situation* (What conditions, experiences, or circumstances are we interested in understanding?)

For example, suppose our question was, "What is it like to suffer from cachexia?" In this case, the question calls for rich qualitative information; the *population* is patients with advanced cancer, and the *situation* is the experience of cachexia.

Table 1.3 offers question templates for asking well-framed clinical questions for specific types of questions. The right-hand column includes questions with an explicit comparison (PICO questions), whereas the middle column does not (PIO). The questions are categorized according to the EBP purposes described earlier.

TABLE 1.3 Question Templates for Clinical Questions: PIO and PICO

Type of Question	PIO Question Template (Questions Without an Explicit Comparison)	PICO Question Template (Questions With an Explicit Comparison)
Therapy/treatment/intervention	In_____(**P**opulation), what is the effect of_____(**I**ntervention) on_____(**O**utcome)?	In_____(**P**opulation), what is the effect of_____(**I**ntervention), in comparison to_____(**C**omparative/alternative intervention), on_____(**O**utcome)?
Diagnosis/assessment	For_____(**P**opulation), does_____(**I**dentifying tool/procedure) yield accurate and appropriate diagnostic/assessment information about_____(**O**utcome)?	For_____(**P**opulation), does_____(**I**dentifying tool/procedure) yiel more accurate or more appropriate diagnostic/assessment information than_____(**C**omparative tool/procedure) about_____(**O**utcome)?
Prognosis	In_____(**P**opulation), does_____(**I**nfluence/exposure to disease or condition) increase the risk of_____(**O**utcome)?	In_____(**P**opulation), does_____(**I**nfluence/exposure to disease o condition), relative to_____(**C**omparative disease/condition OR absence of the disease/conditio increase the risk of_____(**O**utcome)?
Etiology/harm	In_____(**P**opulation), does_____(**I**nfluence/exposure/characteristic) increase the risk of_____(**O**utcome)?	In_____(**P**opulation), does_____(**I**nfluence/exposure/characterist compared to_____(**C**omparative influence/exposure OR lack of influence or exposure increase the risk of_____(**O**utcome)?
Description (prevalence/incidence)	In_____(**P**opulation), how prevalent is_____(**O**utcome)?	*Explicit comparisons are not typical, except to compare different populations.*
Meaning or process	What is it like for_____(**P**opulation) to experience (condition, illness, circumstance)? OR What is the process by which_____(**P**opulation) cope with, adapt to, or live with_____(condition, illness, circumstance)?	*Explicit comparisons are not typical in these types of questions.*

TIP Although EBP has had a powerful and beneficial impact on health care practices, recent concerns have emerged regarding the applicability of evidence from systematic reviews for individual patients. In Chapter 18, we elaborate on new ideas for

creating *practice-based evidence* that enhances *applicability* to individuals, small groups of people, and local contexts.

ASSISTANCE FOR CONSUMERS OF NURSING RESEARCH

We hope that this book will help you develop skills that will allow you to read, appraise, use, and appreciate nursing studies. In each chapter, we present information about methods that nurse researchers use to conduct their studies and provide guidance in several ways. First, we offer tips that often explain what you can expect to find in actual research articles, identified by the icon . There are also special "how-to-tell" tips (identified with the icon) that help with some potentially confusing issues in research articles.

Second, we include guidelines for critically appraising various aspects of a study in every chapter. The guiding questions in Box 1.1 are designed to assist you in using the information in this chapter in a preliminary assessment of a research article.

Box 1.1 Questions for a Preliminary Overview of a Research Report

1. How relevant is the research problem to the practice of nursing?
2. Was the study quantitative or qualitative?
3. What was the underlying purpose (or purposes) of the study—Therapy/intervention, Diagnosis/Assessment, Prognosis, Etiology/harm, Description, or Meaning?
3. What might be some clinical implications of this research? To what type of people and settings is the research most relevant? If the findings were accurate, how might *I* use the results of this study?

And third, we offer opportunities to apply your new skills. The critical thinking exercises at the end of each chapter guide you through appraisals of real examples of qualitative and quantitative studies. These activities also challenge you to think about how the findings from these studies could be used in nursing practice. Answers to some of these questions are in the Student Resources on thePoint® website, and the answers to others are in the Instructor Resources on thePoint® website. Four journal articles for the critical thinking exercises are found in the appendices to this book. The full journal article for studies identified with ** in the references of each chapter are also available on thePoint® website.

RESEARCH EXAMPLES WITH CRITICAL THINKING EXERCISES

This section presents examples of studies with different purposes. Read the research summaries for Examples 1 and 2 and then answer the critical thinking questions that follow, referring to the full research reports if necessary. Answers to these questions are available to instructors on thePoint®. The critical thinking questions for Exercises 3 and 4 are based on the studies that appear in their entirety in Appendices A and B of this book. Our comments for these questions are in the Student Resources section on thePoint®.

EXAMPLE 1: QUANTITATIVE RESEARCH

Study: Effect of inhalation aromatherapy on pain, anxiety, comfort, and cortisol levels during trigger point injection (Kasar et al., 2020)

Study Purpose: The purpose of the study was to test whether lavender oil inhalation had a positive effect on the pain, comfort, anxiety, and cortisol levels of people with myofascial pain syndrome (MPS) during trigger point injection.

Study Methods: A total of 66 patients who were admitted to a hospital clinic in Turkey for trigger point injections were included in the study. The patients were assigned to one of three groups, with 22 patients per group: (1) those receiving lavender oil inhalation during the injections, (2) those receiving inhalation of an odorless organic baby oil, and (3) those not receiving any inhalation application. All study participants were assessed for pain, comfort, and anxiety before and after the injections, and saliva samples were collected for cortisol level measurements.

Key Findings: The researchers found that patients who received the lavender oil inhalation had lower pain and anxiety and higher levels of comfort than patients who did not receive the aromatherapy. The intervention had no effect on saliva cortisol levels.

Conclusions: The researchers "recommended that aromatherapy, which is low cost, noninvasive, and easily applicable, be applied to individuals with MPS during trigger point injection because of its anxiety and stress-reducing effects" (p. 62).

Critical Thinking Exercises

1. Answer questions 1 to 3 in Box 1.1 regarding this study.
2. Also consider the following targeted questions which may assist you in assessing aspects of the study's merit:
   a. Why do you think the researchers used three groups rather than just two to assess the effects of the aromatherapy intervention?
   b. Could this study have been undertaken as a qualitative study? Why or why not?

EXAMPLE 2: QUALITATIVE RESEARCH

Study: Health and disability among young black men (Ricks et al., 2020)

Study Purpose: The purpose of this study was to explore how young Black men in the United Stated experienced the onset of chronic disabling conditions while at the same time negotiating health-promoting activities. The central questions were, What is the essence of losing abilities among young black men in Western societies? and What is the context of learning health promotion among Black men living with disabilities?

Study Methods: Eleven self-identified Black men were screened for functional limitations and were subsequently interviewed twice. The goal of the interviews, which were audiorecorded and later transcribed, was to "gain descriptions of how the men remembered times of socially channeled incapacity" (p. 14). Interviews, which were scheduled 2 to 4 weeks apart, lasted between 30 and 120 minutes. The interviewer maintained detailed field notes about the participants' attire, body language, facial expressions, and demeanor.

Key Findings: Four recurring themes described how masculinity couples with the male body to drive health promotion and health-related decisions: (1) maintaining manhood, (2) economic constraints, (3) the "risk" of health care, and (4) health promotion. Here is an excerpt from an interview that illustrates the third theme on perceived risks: "Most of us don't wanna go to the doctor, man. We're afraid of what they're going to tell us. It's almost like, man, . . . we know . . . we're going to get diagnosed with something. So, oh well, I might as well just live my life and just die not knowing there's something" (p. 19).

Conclusions: The researchers concluded that knowledge of the men's experiences and perspectives contributes to the understanding of their personal challenges and health needs.

Critical Thinking Exercises

1. Answer questions 1 to 3 in Box 1.1 regarding this study.
2. Also consider the following targeted questions, which may assist you in assessing aspects of the study's merit:
   a. Why do you think that the researchers audiorecorded and transcribed their in-depth interviews with study participants?
   b. Do you think it would have been appropriate for the researchers to conduct this study using quantitative research methods? Why or why not?

EXAMPLE 3: QUANTITATIVE RESEARCH IN APPENDIX A

1. Read the abstract and the introduction from Swenson and colleagues' study ("Parents' use of praise and criticism in a sample of young children seeking mental health services") in Appendix A of this book and then answer questions 1 to 3 in Box 1.1.
2. Also consider the following targeted questions:
   a. Could this study have been undertaken as a qualitative study? Why or why not?
   b. Who helped to pay for this research? (This information appears on the first page of the report.)
   c. What might a Prognosis question for this study be?

EXAMPLE 4: QUALITATIVE RESEARCH IN APPENDIX B

1. Read the abstract and the introduction from Beck and Watson's study ("Posttraumatic growth after birth trauma") in Appendix B of this book and then answer questions 1 to 3 in Box 1.1.
2. Also consider the following targeted questions:
   a. Was Beck and Watson's study conducted within the positivist paradigm or the constructivist paradigm? Provide a rationale for your choice.
   b. What was the phenomenon that Beck and Watson were studying? How was it defined?

WANT TO KNOW MORE?

A wide variety of resources to enhance your learning and understanding of this chapter is available on thePoint®.

- Chapter Supplement on The History of Nursing Research
- Answers to the Critical Thinking Exercises for Examples 3 and 4
- Internet Resources with useful websites for Chapter 1
- A Wolters Kluwer journal article on a topic related to this chapter

Additional study aids, including eight journal articles and related questions, are also available in *Study Guide for Essentials of Nursing Research, 10e*.

Summary Points

- **Nursing research** is systematic inquiry undertaken to develop evidence on problems of importance to nurses.
- Nurses in various settings are adopting an **evidence-based practice (EBP)** that incorporates research findings into their decisions and interactions with clients.
- Knowledge of nursing research enhances the professional practice of all nurses—including both *consumers of research* (who read and evaluate studies) and *producers of research* (who design and undertake studies).
- Nursing research began with Florence Nightingale but developed slowly until its rapid acceleration in the 1950s. Since the 1980s, a major focus has been on **clinical nursing research**—that is, on problems relating to clinical practice.
- The National Institute of Nursing Research (NINR), established at the U.S. National Institutes of Health in 1993, affirms the stature of nursing research in the United States.
- Contemporary issues in nursing research include the growth of EBP, expansion of local research and quality improvement efforts, research synthesis through systematic reviews, **patient centeredness**, interest in the **applicability** of research to individual patients or groups, and efforts to measure the **clinical significance** of research results.
- Disciplined research stands in contrast to other knowledge sources for nursing practice, such as tradition, authority, personal experience, and trial and error.
- Disciplined inquiry in nursing is conducted mainly within two **paradigms**—worldviews with underlying **assumptions** about reality: the positivist paradigm and the constructivist paradigm.
- In the **positivist paradigm**, it is assumed that there is an objective reality and that natural phenomena are regular and orderly. The assumption of *determinism* refers to the belief that phenomena result from prior causes and are not haphazard.
- **Quantitative research** (associated with positivism) involves the collection and analysis of numeric information. Quantitative research is typically conducted within the traditional **scientific method**, which is systematic and controlled. Quantitative researchers base their findings on **empirical evidence** (evidence collected by way of the human senses) and strive for **generalizability** beyond a single setting or situation.
- In the **constructivist paradigm**, it is assumed that reality is not a fixed entity but is rather a construction of human minds—and thus "truth" is a composite of multiple constructions of reality.
- Constructivist researchers emphasize understanding human experience as it is lived through the collection and analysis of subjective, narrative materials using flexible procedures; this paradigm is associated with **qualitative research**.
- A fundamental distinction that is especially relevant in quantitative research is between studies whose primary intent is to *describe* phenomena and those that are **cause-probing**—i.e., designed to illuminate underlying causes of phenomena. Specific purposes on a description/explanation continuum include identification, description, exploration, prediction/control, and explanation.
- Nursing studies can also be classified in terms of EBP-related aims: Therapy/intervention, Diagnosis/assessment, Prognosis, Etiology (causation)/prevention of harm, Description, and Meaning/processes. Therapy questions are foundational for evidence-based decision making.
- EBP is the conscientious integration of current best evidence and other factors in making clinical decisions. The three "legs" of EBP are (1) best research evidence, (2) patient preferences and values, and (3) nurses' own clinical experience and knowledge.
- **Primary studies** of original research published in professional journals are one source of evidence for EBP, but preprocessed (synthesized) evidence is especially useful in addressing clinical queries. Systematic reviews, considered the cornerstone of EBP, are important sources of evidence.
- **Systematic reviews** are rigorous integrations of research evidence from multiple studies on a topic. Systematic reviews can involve either narrative approaches to integration (including **metasynthesis** and **meta-aggregation** of qualitative studies) or quantitative approaches (**meta-analysis**) that integrate findings statistically by using individual studies as the unit of analysis.
- There has been a proliferation of **evidence hierarchies** that provide a preliminary guide for finding "best" evidence—evidence with the lowest risk of bias. Evidence hierarchies reflect **level of evidence (LOE) scales** that rank order types of evidence source—primarily for Therapy/intervention questions. In LOEs for Therapy questions, systematic reviews of *randomized controlled trials* (RCTs) are considered Level I sources.
- EBP efforts typically start by asking a well-worded clinical question for which evidence is then sought. A widely used scheme for asking well-worded clinical questions involves four primary components, an acronym for which is **PICO**: Population or patients (P), Intervention or influence (I), Comparison (C), and Outcome (O).

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*A link to this open-access article is provided in the Internet Resources section on thePoint® website.

**This journal article is available on thePoint® for this chapter.

2 Understanding Key Concepts and Steps in Quantitative and Qualitative Research

Learning Objectives

On completing this chapter, you will be able to:

- Define new terms presented in the chapter and distinguish terms associated with quantitative and qualitative research
- Distinguish experimental and nonexperimental research
- Identify three main disciplinary traditions for qualitative nursing research
- Describe the flow and sequence of activities in quantitative and qualitative research and discuss how and why they differ

Key Terms

- Associative relationship
- Cause-and-effect (causal) relationship
- Clinical trial
- Concept
- Conceptual definition
- Construct
- Data
- Dependent variable
- Emergent design
- Ethnography
- Experimental research
- Gaining entrée
- Grounded theory
- Hypothesis
- Independent variable
- Informant
- Intervention protocol

- Literature review
- Nonexperimental research
- Observational study
- Operational definition
- Outcome variable
- Phenomenology
- Population
- Qualitative data
- Qualitative descriptive research
- Quantitative data
- Relationship
- Research design
- Sample
- Saturation
- Statistical analysis
- Study participant
- Subject
- Theme
- Theory
- Variable

THE BUILDING BLOCKS OF RESEARCH

Research, like any discipline, has its own language—its own *jargon* that can sometimes be intimidating. We readily admit that the jargon is plentiful and can be confusing. Some research jargon used in nursing research has its roots in the social sciences, but sometimes, different terms are used in medical research. Also, some terms are used by both qualitative and quantitative researchers, but others are used mainly by one or the other group. Please bear with us as we cover key terms that you will likely encounter in the research literature.

The Faces and Places of Research

When researchers address a research question, they are doing a *study* (or an *investigation*). Studies with humans involve two sets of people: those who do the research and those who provide the information. In a quantitative study, the people being studied are called **subjects** or **study participants**, as shown in Table 2.1. In a qualitative study, the people cooperating in the study are called study participants or **informants**. The person who conducts the research is the *researcher* or *investigator*. Studies are often undertaken by a research team rather than by a single researcher.

TABLE 2.1 Key Terms in Quantitative and Qualitative Research

Concept	Quantitative Term	Qualitative Term
Person contributing information	Subject Study participant —	— Study participant Informant, key informant
Person undertaking the study	Researcher Investigator	Researcher Investigator
That which is being investigated	— Concepts Constructs Variables	Phenomena Concepts — —
Information gathered	Data (numerical values)	Data (narrative descriptions)
Connections between concepts	Relationships (cause-and-effect, associative)	Patterns of association
Logical reasoning processes	Deductive reasoning	Inductive reasoning

HOW-TO-TELL TIP How can you tell if an article appearing in a nursing journal is a *study*? In journals that specialize in research (e.g., the journal *Nursing Research*), most articles are original research reports, but in specialty journals, there is usually a mix of research and nonresearch articles. Sometimes you can tell by the title, but sometimes you cannot. You can tell, however, by looking at the major headings of an article. If there is no heading called "Method" or "Research Design" (the section that describes what a researcher *did*) and no heading called "Findings" or "Results" (the section that describes what a researcher *learned*), then it is probably not a study.

Research can be undertaken in a variety of *settings* (the types of place where information is gathered), such as clinics, homes, or other community settings. A *site* is the broad location for the research—it could be an entire community (e.g., a Haitian neighborhood in Miami) or an institution (e.g., a nursing home in Seattle). Researchers sometimes do *multisite studies* because the use of multiple sites yields a larger and often more diverse group of participants.

Concepts, Constructs, and Theories

Research addresses real-world problems, but studies are conceptualized in abstract terms. For example, *pain*, *fatigue*, and *obesity* are abstractions of human attributes. These abstractions are called *phenomena* (especially in qualitative studies) or **concepts**.

Researchers sometimes use the term **construct**, which also refers to an abstraction, but often one that is deliberately invented (or constructed). For example, *self-care* in Orem's model of health maintenance is a construct. The terms *construct* and *concept* are sometimes used interchangeably, but a construct often refers to a more complex abstraction than a concept.

A **theory** is an explanation of some aspect of reality. In a theory, concepts are knitted together into a coherent system to describe or explain some aspect of the world. Theories play a role in both qualitative and quantitative research. In a quantitative study, researchers sometimes start with a theory and, using deductive reasoning, make predictions about how phenomena would behave in the real world *if the theory were valid*. The specific predictions are then tested. In qualitative studies, theory often is the *product* of the research: The investigators use information from study participants inductively to develop a theory rooted in the participants' experiences.

TIP The reasoning process of *deduction* is associated with quantitative research, and *induction* is associated with qualitative research. The supplement for Chapter 2 on thePoint® website explains and illustrates the distinction.

Variables

In quantitative studies, concepts are called **variables**. A variable, as the name implies, is something that varies. Weight, anxiety, and nausea are all variables—they vary from one person to another. Most human characteristics are variables. If everyone weighed 150 pounds, weight would not be a variable, it would be a *constant*. But it is precisely because people and conditions *do* vary that most research is conducted. Quantitative researchers seek to understand how or why things vary and to learn how differences in one variable relate to differences in another. For example, in lung cancer research, lung cancer is a variable because not everybody has this disease. Researchers have studied factors that might be linked to lung cancer, such as cigarette smoking. Smoking is also a variable because not everyone smokes. A variable, then, is any quality of a person, group, or situation that varies or takes on different values. Variables are the central building blocks of quantitative studies.

TIP Every study focuses on one or more phenomena, concepts, or variables, but these terms per se are not necessarily used in research reports. For example, a report might say, "The purpose of this study is to examine the effect of nurses' workload on hand hygiene compliance." Although the researcher did not explicitly label anything a variable, the variables under study are *workload* and *hand hygiene compliance*. Key concepts or variables are often indicated in the study title.

Characteristics of Variables

Variables are often inherent human traits, such as age or weight, but sometimes researchers *create* a variable. For example, if a researcher tests the effectiveness of patient-controlled analgesia compared to intramuscular analgesia in relieving pain after surgery, some patients would be given one type of analgesia and some would receive the other. In the context of this study, method of pain management is a variable because different patients are given different methods.

Some variables take on a wide range of values than can be represented on a continuum (e.g., a person's age or weight). Other variables take on only a few values; sometimes such variables convey quantitative information (e.g., number of children), but others simply involve placing people into categories (e.g., blood type A, B, AB, or O).

Dependent and Independent Variables

As noted in Chapter 1, many studies seek to understand causes of phenomena. Does a nursing intervention *cause* improvements in patient outcomes? Does smoking *cause* lung cancer? The presumed cause is the **independent variable**, and the presumed effect is the **dependent** or **outcome variable**. The dependent variable is the outcome that researchers want to understand, explain, or predict. In terms of the PICO scheme discussed in Chapter 1, the dependent variable corresponds to the "O" (outcome). The independent variable corresponds to the "I" (the intervention, influence, or exposure), plus the "C" (the comparison).

TIP In *searching* for evidence, a nurse might want to learn about the effects of an intervention or influence (I), compared to *any* alternative, on an outcome (O) of interest. In a cause-probing study, however, researchers must always specify the comparator (the "C").

The terms *independent variable* and *dependent variable* also can be used to indicate *direction of influence* rather than cause and effect. For example, suppose we compared levels of depression among men and women diagnosed with pancreatic cancer and found men to be more depressed. We could not conclude that depression was *caused* by gender. Yet the direction of influence clearly runs from gender to depression: It makes no sense to suggest that patient's depression influenced their gender. In this situation, it is appropriate to consider depression as the dependent variable and gender as the independent variable.

TIP Few research reports explicitly label variables as dependent and independent. Moreover, variables (especially independent variables) are sometimes not fully spelled out. Take the following research question: What is the effect of exercise on heart rate? In this example, heart rate is the dependent variable. Exercise, however, is not in itself a variable. Rather, exercise versus something else (e.g., no exercise) is a variable; "something else" is implied rather than stated in the research question.

Most outcomes have multiple causes or influences. If we were studying factors that influence people's body mass index, the independent variables might be height, physical activity, and diet. And, two or more outcome variables often are of interest. For example, a researcher may compare the effects of alternative dietary interventions on participants' weight, lipid profile, and self-esteem. It is common to design studies with multiple independent and dependent variables.

Variables are not *inherently* dependent or independent. A dependent variable in one study could be an independent variable in another. For example, a study might examine the effect of an exercise intervention (the independent variable) on osteoporosis (the dependent variable) to answer a Therapy question. Another study might investigate the effect of osteoporosis (the independent variable) on bone fracture incidence (the dependent variable) to address a Prognosis question. In short, whether a variable is independent or dependent is a function of the role that it plays in a particular study.

Example of independent and dependent variables

Research question (Etiology/Harm question): Is vitamin D deficiency associated with poor sleep quality in African American and Hispanic pregnant women? (Woo et al., 2020)
Independent variable: Vitamin D deficiency (versus no Vitamin D deficiency)
Dependent variable: Sleep quality

Conceptual and Operational Definitions

The concepts of interest to researchers are abstractions, and researchers' worldview shapes how those concepts are defined. A **conceptual definition** is the theoretical meaning of a concept. Researchers need to conceptually define even seemingly straightforward terms. A classic example is the concept of *caring*. Morse and colleagues (1990) examined how researchers and theorists defined *caring* and identified five categories of conceptual definitions: a human trait, a moral imperative, an affect, an interpersonal relationship, and a therapeutic intervention. More recently, Andersson and colleagues (2015) found that nurses offered multiple interpretations of caring. Researchers undertaking studies of caring need to clarify how they conceptualized it.

In qualitative studies, conceptual definitions of key phenomena may be a major end product, reflecting an intent to have concepts explained by those being studied. In quantitative studies, however, researchers must define concepts at the outset because they must decide how the variables will be measured. An **operational definition** specifies what the researchers must do to measure the concept and collect needed information.

Readers of research articles may not agree with how researchers conceptualized and operationalized variables. However, definitional precision is important in communicating what concepts mean within the context of the study.

Example of conceptual and operational definitions

Webel and colleagues (2020) studied the relationships among social capital, HIV self-management, and substance use in women. *Social capital* was conceptually defined as "the aggregation of potential resources, linked to a durable network of relationships of mutual acquaintance or recognition . . . components of social capital include reciprocity, trust, safety, social agency, social networks, value of life, and employment connections" (p. 5). The construct of social capital was operationalized using a measure with 36 questions, called the Social Capital Scale.

Data

Research **data** (singular, datum) are the pieces of information gathered in a study. In quantitative studies, researchers identify and define their variables and then collect relevant data from participants. The actual *values* of the study variables constitute the data. Quantitative researchers collect primarily **quantitative data**—information in numeric form. For example, if we conducted a quantitative study in which a key variable was *depression*, we would need to measure how depressed participants were. We might ask, "Thinking about the past week, how depressed would you say you have been on a scale from 0 to 10, where 0 means 'not at all' and 10 means 'the most possible'?" Box 2.1 presents quantitative data for three fictitious people. Subjects provided a number on the 0 to 10 continuum corresponding to their degree of depression—9 for subject 1 (a high level of depression), 0 for subject 2 (no depression), and 4 for subject 3 (mild depression).

Box 2.1 Example of Quantitative Data

Question:	Thinking about the past week, how depressed would you say you have been on a scale from 0 to 10, where 0 means "not at all" and 10 means "the most possible"?
Data:	9 (Subject 1) 0 (Subject 2) 4 (Subject 3)

In qualitative studies, researchers collect primarily **qualitative data**, that is, narrative descriptions. Narrative data can be obtained by conversing with participants, by making notes about their behavior in naturalistic settings, or by obtaining narrative records, such as diaries. Suppose we were studying depression qualitatively. Box 2.2 presents qualitative data for three participants responding conversationally to the question, "Tell me about how you've been feeling lately—have you felt sad or depressed at all, or have you generally been in good spirits?" Here, the data consist of rich narrative descriptions of participants' emotional state. In reports on qualitative studies, researchers include excerpts from their narrative data to support their interpretations.

Box 2.2 Example of Qualitative Data

Question:	Tell me about how you've been feeling lately—have you felt sad or depressed at all, or have you generally been in good spirits?
Data:	"Well, actually, I've been pretty depressed lately, to tell you the truth. I wake up each morning and I can't seem to think of anything to look forward to. I mope around the house all day, kind of in despair. I just can't seem to shake the blues and I've begun to think I need to go see a shrink." (Participant 1) "I can't remember ever feeling better in my life. I just got promoted to a new job that makes me feel like I can really get ahead in my company. And I've just gotten engaged to a really great guy who is very special." (Participant 2) "I've had a few ups and downs the past week but basically things are on a

pretty even keel. I don't have too many complaints." (Participant 3)

Relationships

Researchers usually study phenomena in relation to other phenomena—they examine relationships. A **relationship** is a connection between phenomena; for example, researchers repeatedly have found that there is a *relationship* between frequency of turning bedridden patients and the incidence of pressure ulcers. Qualitative and quantitative researchers examine relationships in different ways.

In quantitative studies, relationships are often explicitly expressed in quantitative terms, such as *more than* or *less than*. For example, consider a person's weight as our outcome variable. What variables are related to (associated with) a person's weight? Some possibilities include height, caloric intake, and exercise. For each independent variable, we can make a prediction about its relationship to the outcome:

Height: Tall people will weigh more than short people.
Caloric intake: People with high caloric intake will be heavier than those with low caloric intake.
Exercise: The lower the amount of exercise, the greater will be the person's weight.

Each statement expresses a predicted relationship between weight (the outcome) and a measurable independent variable. Most quantitative research is conducted to assess whether relationships exist among variables and to measure how strong the relationship is.

TIP Relationships are expressed in two basic forms. First, relationships can be expressed as "if more of Variable X, then more of (or less of) Variable Y." For example, there is a relationship between height and weight: With greater height, there tends to be greater weight, i.e., tall people tend to weigh more than short people. The second form involves relationships expressed as group differences. For example, there is a relationship between gender and height: Men tend to be taller than women.

Variables can be related to one another in different ways, including **cause-and-effect** (or **causal**) **relationships**. Within the positivist paradigm, natural phenomena are assumed to have antecedent causes that are discoverable. For example, we might speculate that there is a causal relationship between caloric intake and weight: All else being equal, eating more calories causes greater weight. As noted in Chapter 1, many quantitative studies are *cause-probing*—they seek to illuminate the causes of phenomena.

Example of a study of causal relationships

Chen and colleagues (2020) studied whether the use of virtual reality for children during intravenous injections would *cause* improvements in the children's pain and fear and shorten time for intravenous insertions.

Not all relationships can be interpreted as causal. There is a relationship, for example, between a person's pulmonary artery and tympanic temperatures: People with high readings on one tend to have high readings on the other. We cannot say, however, that pulmonary artery temperature *caused* tympanic temperature, or vice versa. This type of relationship is sometimes referred to as an **associative** (or *functional*) **relationship** rather than a causal one.

Example of a study of associative relationships

Kwon and colleagues (2020) studied factors associated with adolescents' Internet use and suicide ideation. In their sample of over 60,000 adolescents, they found that a higher percentage of suicide ideation was reported by girls than by boys. Gender was also associated with a different amount of Internet use by those with suicide ideation.

Qualitative researchers are not concerned with quantifying relationships nor in testing and confirming causal relationships. However, qualitative researchers may seek patterns of association as a way of illuminating the underlying meaning and dimensionality of phenomena of interest. Patterns of interconnected concepts are identified as a means of understanding the whole.

Example of a qualitative study of patterns

Epstein and colleagues (2020) explored newly graduated nurses' strategies for, and experiences of, sleep problems when starting shiftwork. They reported that for these new nurses, sleep problems were common, especially during "quick returns"—an evening shift followed by a morning shift—and that high workload on the evening shift worsened the problem.

MAJOR CLASSES OF QUANTITATIVE AND QUALITATIVE RESEARCH

Researchers usually work within a paradigm that is consistent with their worldview and that gives rise to the types of question that excite their curiosity. In this section, we briefly describe broad categories of quantitative and qualitative research.

Quantitative Research: Experimental and Nonexperimental Studies

A basic distinction in quantitative studies is between experimental and nonexperimental research. In **experimental research**, researchers actively introduce an intervention or treatment—usually to address Therapy questions. In **nonexperimental research**, on the other

hand, researchers are bystanders—they collect data without introducing treatments (most often, to address Etiology, Prognosis, Diagnosis, or Description questions). For example, if a researcher gave bran flakes to one group of subjects and prune juice to another to evaluate which method facilitated elimination more effectively, the study would be experimental because the researcher intervened. If, on the other hand, a researcher compared elimination patterns of two groups whose regular eating patterns differed, the study would be nonexperimental because there is no intervention. In medical and epidemiological research, experimental studies usually are called **clinical trials**, and nonexperimental inquiries are called **observational studies**.

Experimental studies are explicitly designed to test causal relationships—to test whether an intervention *causes* changes in the outcome. Sometimes, nonexperimental studies also explore causal relationships, but causal inferences in nonexperimental research are tricky and less conclusive, for reasons we explain in a later chapter.

Example of experimental research

Kim and coresearchers (2020) tested whether the time of postoperative feeding after total hip arthroplasty affected such gastrointestinal outcomes as nausea, vomiting, abdominal pain, and time to defecation. Some participants had early postoperative feeding (4 hours postoperatively) or late postoperative feeding (8+ hours postoperatively).

In this example, the researchers intervened by designating that some patients would be fed their first postoperative meal at 4 hours after the procedure and others would be fed 8 hours or more after the procedure. In other words, the researcher *controlled* the independent variable, which in this case was the timing of the postoperative meal to see if timing affected important outcomes.

Example of nonexperimental research

Matsunaga-Myoji and colleagues (2020) did a 3-year follow-up study of patients who had undergone total hip arthroplasty. They examined changes over time in the patients' physical activity, physical function, and quality of life. They also examined factors associated with improved outcomes (e.g., the patients' age).

In this nonexperimental study to address a Prognosis question, the researchers did not intervene in any way. They were interested in a similar population as in the previous example (people who had a hip arthroplasty), but their intent was to study patterns of improvement or decline after the arthroplasty and associated factors.

Qualitative Research: Disciplinary Traditions

The majority of qualitative nursing studies can best be described as **qualitative descriptive research**. Many qualitative studies, however, are rooted in research traditions that originated in

anthropology, sociology, and psychology. Three such traditions are briefly described here. Chapter 10 provides a fuller discussion of these and other traditions and the methods associated with them.

Grounded theory research seeks to describe and understand key social psychological processes. Grounded theory was developed in the 1960s by two sociologists, Glaser and Strauss (1967). The focus of most grounded theory studies is on a developing social experience —the social and psychological processes that characterize an event or situation. A major component of grounded theory is the discovery of a *core variable* that is central in explaining what is going on in that social scene. Grounded theory researchers strive to generate explanations of phenomena that are grounded in reality.

Example of a grounded theory study

Bloxsome and colleagues (2020) used grounded theory methods to understand why midwives in Western Australia choose to remain in their profession. The researchers' analysis of their in-depth data revealed that the core variable was *I love being a midwife; it's who I am*.

Phenomenology is concerned with the lived experiences of humans. Phenomenology is an approach to thinking about what people's life experiences are like and what they mean. Phenomenological researchers ask the questions: What is the *essence* of this phenomenon as experienced by these people? or, What is the meaning of the phenomenon to those who experience it?

Example of a phenomenological study

Celia and colleagues (2020) conducted in-depth interviews to explore the lived experiences of parents caring for their autistic children and their experiences with safety for these children.

Ethnography, the primary research tradition in anthropology, provides a framework for studying the patterns and lifeways of a defined cultural group in a holistic fashion. Ethnographers typically engage in extensive *fieldwork*, often participating to the extent possible in the life of the culture under study. Ethnographers strive to learn from members of a cultural group, to understand their worldview, and to describe their customs and norms.

Example of an ethnographic study

Chaaban and colleagues (2020) conducted an ethnographic study of the culture of French nursing homes to understand nurses' influence on prescribing antibiotics for the treatment of suspected infections.

MAJOR STEPS IN A QUANTITATIVE STUDY

In quantitative studies, researchers move from the beginning point of a study (posing a question) to the end point (obtaining an answer) in a reasonably linear sequence of steps that is broadly similar across studies (Fig. 2.1). This section describes that flow, and the next section describes how qualitative studies differ.

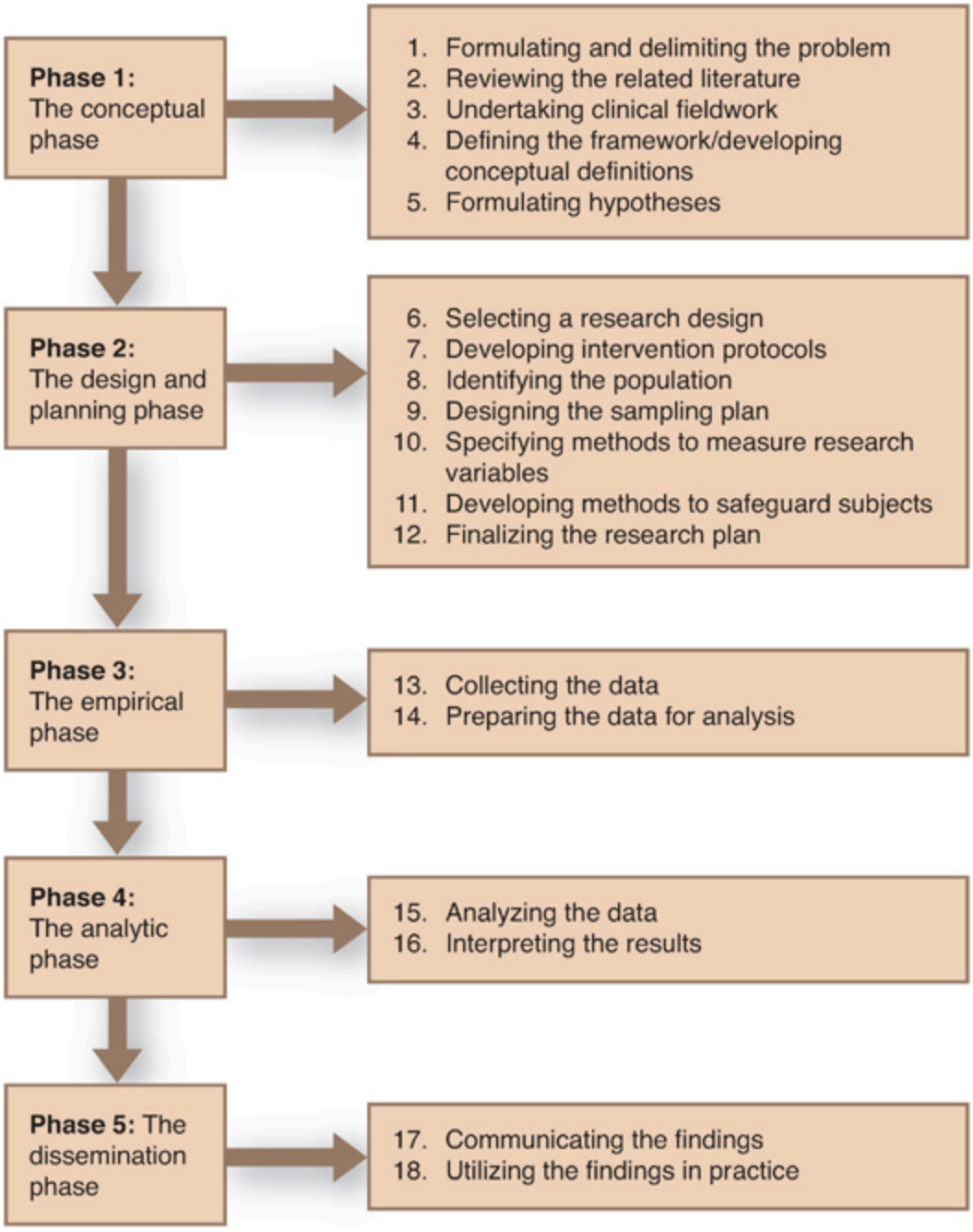

Figure 2.1 Flow of steps in a quantitative study.

Phase 1: The Conceptual Phase

The early steps in a quantitative study typically involve activities with a strong conceptual element. During this phase, researchers rely on creativity, deductive reasoning, and a grounding in research evidence on the focal topic.

Step 1: Formulating and Delimiting the Problem

Quantitative researchers begin by identifying an interesting research problem and formulating *research questions*. The research questions identify what the study variables are. In developing questions, nurse researchers must attend to substantive issues (Is this problem important?), theoretical issues (Is there a conceptual framework for this problem?), clinical issues (Will findings be useful in clinical practice?), methodologic issues (How can this question be answered to yield high-quality evidence?), and ethical issues (Can this question be addressed in an ethical manner?).

Step 2: Reviewing the Related Literature

Quantitative research is conducted within the context of previous knowledge. Quantitative researchers typically strive to understand what is already known about a topic by undertaking a thorough **literature review** before any data are collected.

Step 3: Undertaking Clinical Fieldwork

Researchers embarking on a clinical study often benefit from spending time in relevant clinical settings (in the *field*), discussing the topic with clinicians and observing current practices. Such clinical fieldwork can provide perspectives on clinicians' and clients' viewpoints.

Step 4: Defining the Framework and Developing Conceptual Definitions

When quantitative research is performed within the context of a theoretical framework, the findings may have broader significance and utility. Even when the research question is not embedded in a theory, researchers should have a conceptual rationale and a clear vision of the concepts under study.

Step 5: Formulating Hypotheses

Hypotheses state researchers' expectations about relationships between study variables. Hypotheses are predictions of the relationships that researchers expect to observe in the study data. The research question identifies the concepts of interest and asks how the concepts might be related; a hypothesis is the predicted answer. Most quantitative studies are designed to test hypotheses through statistical analysis.

Phase 2: The Design and Planning Phase

In the second major phase of a quantitative study, researchers decide on the methods they will use to address the research question. Researchers make many methodological decisions that have crucial implications for the quality of study evidence.

Step 6: Selecting a Research Design

The **research design** is the overall plan for obtaining answers to the research questions. Quantitative designs tend to be structured and controlled, with the goal of minimizing bias. Research designs also indicate how often data will be collected and what types of comparisons will be made. The research design is the architectural backbone of the study.

Step 7: Developing Protocols for the Intervention

In experimental research, researchers introduce an intervention. An **intervention protocol** for the study must be developed, specifying exactly what the intervention will entail (e.g., who will administer it, over how long a period will the treatment last, and so on) *and* what the comparative condition will be. In nonexperimental research, this step is not necessary.

Step 8: Identifying the Population

Quantitative researchers need to specify what characteristics study participants should possess —that is, they must identify the population to be studied. A **population** is *all* the individuals or objects with common, defining characteristics (the "P" component in PICO questions).

Step 9: Designing the Sampling Plan

Researchers collect data from a **sample**, which is a subset of the population. The researcher's *sampling plan* specifies how the sample will be selected and how many participants there will be. The goal is to have a sample that adequately reflects the population's traits.

Step 10: Specifying Methods to Measure Research Variables

Quantitative researchers must find methods to measure their research variables accurately. A variety of quantitative data collection approaches exist; the primary methods are *self-reports* (e.g., interviews and questionnaires), *observations* (e.g., watching and recording people's behavior), and *biophysiological measures (biomarkers)*. The task of measuring research variables and developing a *data collection plan* is complex and challenging.

Step 11: Developing Methods to Safeguard Human/Animal Rights

Most nursing research involves humans, although some involve animals. In either case, procedures need to be developed to ensure that the study adheres to ethical principles.

Step 12: Reviewing and Finalizing the Research Plan

Before collecting data, researchers often undertake assessments to ensure that procedures will work smoothly. For example, they may evaluate the *readability* of written materials to see if participants with low reading skills can comprehend them. Researchers usually have their research plan critiqued by reviewers to obtain clinical or methodological feedback. Researchers seeking financial support submit a *proposal* to a funding source.

Phase 3: The Empirical Phase

The third phase of quantitative research involves collecting the data. This phase is often the most time-consuming part of the study. Data collection often requires months or years of work.

Step 13: Collecting the Data

The actual collection of data in a quantitative study often proceeds according to a preestablished plan. The plan typically spells out procedures for training data collection staff, for implementing the sampling plan and collecting data (e.g., where and when the data will be gathered), and for recording information.

Step 14: Preparing the Data for Analysis

Data collected in a quantitative study must be prepared for analysis. For example, one preliminary step is *coding*, which involves translating verbal data into numeric form (e.g., coding gender information as "1" for females, "2" for males, and "3" for other).

Phase 4: The Analytic Phase

Quantitative data must be subjected to analysis and interpretation, which occur in the fourth major phase of a project.

Step 15: Analyzing the Data

To answer research questions and test hypotheses, researchers analyze their data in a systematic fashion. Quantitative data are analyzed through **statistical analyses**, which include some simple procedures (e.g., computing an average) as well as more complex methods.

Step 16: Interpreting the Results

Interpretation involves making sense of study results and examining their implications. Researchers attempt to explain the findings in light of prior evidence, theory, and clinical experience—and in light of the adequacy of the methods they used in the study. Interpretation also involves coming to conclusions about the *clinical significance* of the new evidence.

Phase 5: The Dissemination Phase

In the analytic phase, researchers come full circle: The questions posed at the outset are answered. The researchers' job is incomplete, however, until study results are disseminated.

Step 17: Communicating the Findings

A study cannot contribute evidence to nursing practice if the results are not communicated. Another—and often final—task of a research project is the preparation of a *research report* that can be shared with others. We discuss research reports in the next chapter.

Step 18: Putting the Evidence Into Practice

Ideally, the concluding step of a high-quality study is to plan for its use in practice settings. Although nurse researchers may not implement a plan for using research findings, they can

contribute to the process by developing recommendations on how the evidence could be used in practice, by ensuring that adequate information has been provided for a meta-analysis, and by pursuing opportunities to disseminate the findings to practicing nurses.

ACTIVITIES IN A QUALITATIVE STUDY

Quantitative research involves a fairly linear progression of tasks—researchers plan what steps to take and then follow those steps. In qualitative studies, by contrast, the progression is closer to a circle than to a straight line. Qualitative researchers continually examine and interpret data and make decisions about how to proceed based on what has been discovered (Fig. 2.2).

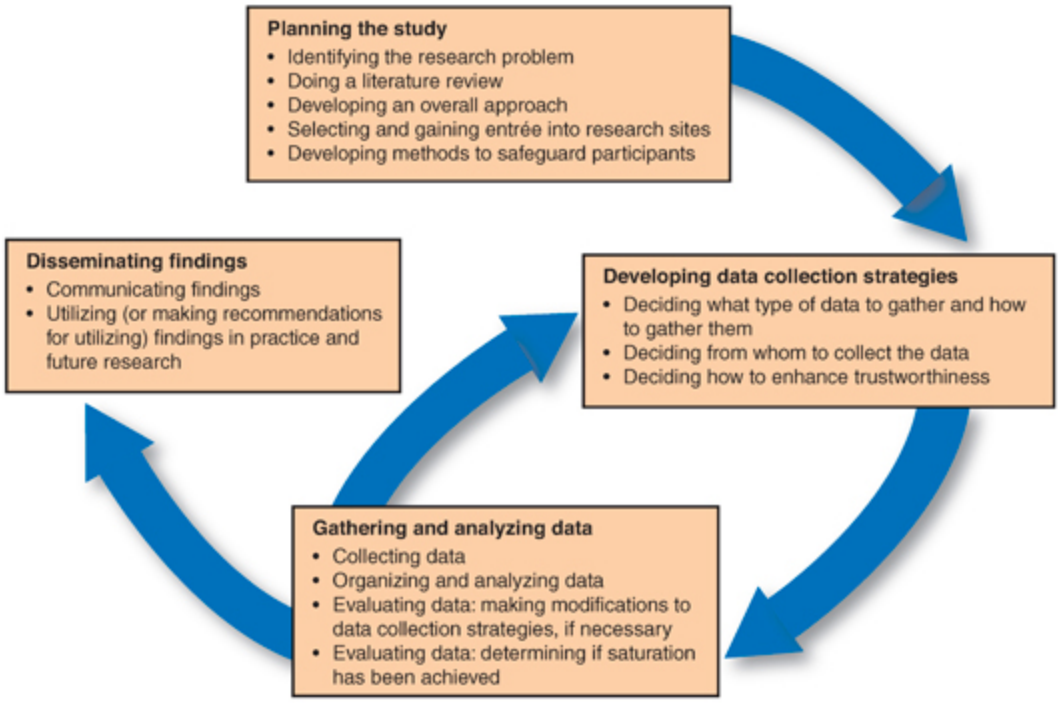

Figure 2.2 Flow of activities in a qualitative study.

Because qualitative researchers have a flexible approach, we cannot show the flow of activities precisely—the flow varies from one study to another, and researchers themselves may not know in advance how the study will unfold. We provide a general sense of qualitative studies by describing major activities and indicating when they might be performed.

Conceptualizing and Planning a Qualitative Study

Identifying the Research Problem

Qualitative researchers usually begin with a general topic, often focusing on an aspect about which little is known. Qualitative researchers often proceed with a fairly broad initial question that allows the focus to be sharpened and delineated more clearly once the study is underway.

Doing a Literature Review

Some qualitative researchers avoid consulting the literature before collecting data. They worry that prior studies might influence the conceptualization of the phenomenon under study, which they believe should be based on participants' viewpoints rather than on prior findings. Others believe that researchers should conduct at least a brief literature review at the outset. In any case, qualitative researchers typically find a relatively small body of relevant previous work because of the type of questions they ask.

Selecting and Gaining Entrée Into Research Sites

Before going into the field, qualitative researchers must identify an appropriate site. For example, if the topic is the health beliefs of the urban poor, an inner-city neighborhood with a concentration of low-income residents must be identified. In some cases, researchers may have access to the selected site, but in others they need to gain entrée into it. Gaining entrée typically involves negotiations with *gatekeepers* who have the authority to permit entry into their world.

TIP The process of gaining entrée is usually associated with doing fieldwork in qualitative studies, but quantitative researchers often need to gain entrée into sites for collecting data as well.

Developing an Overall Approach

Quantitative researchers do not collect data before finalizing their research design. Qualitative researchers, by contrast, use an **emergent design** that materializes during data collection. Certain design features are guided by the study's qualitative tradition, but qualitative studies rarely have rigid designs that prohibit changes while in the field.

Addressing Ethical Issues

Qualitative researchers must also develop plans for addressing ethical issues—and, indeed, there are special concerns in qualitative studies because of the more intimate nature of the relationship that typically develops between researchers and participants.

Conducting a Qualitative Study

In qualitative studies, the tasks of sampling, data collection, data analysis, and interpretation typically take place iteratively. Qualitative researchers often begin by talking with people who have firsthand experience with the phenomenon of interest. The discussions are loosely structured, allowing participants to express a full range of beliefs, feelings, and behaviors. Analysis and interpretation are ongoing activities that guide choices about "next steps."

The process of data analysis involves clustering related narrative information into a coherent scheme. Through inductive reasoning, researchers identify **themes** and categories,