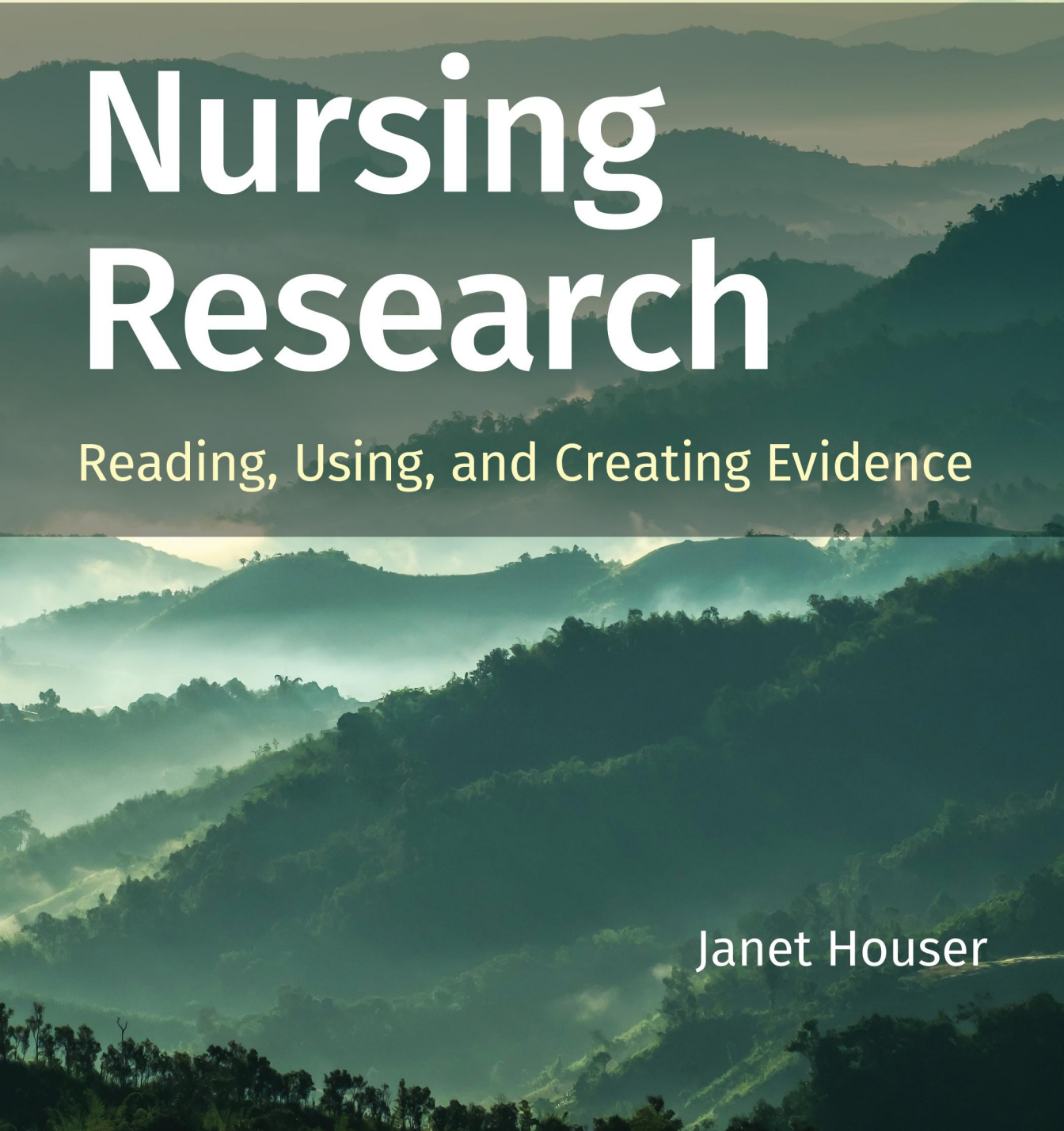
FIFTH EDITION

Nursing Research

Reading, Using, and Creating Evidence



Janet Houser

FIFTH EDITION

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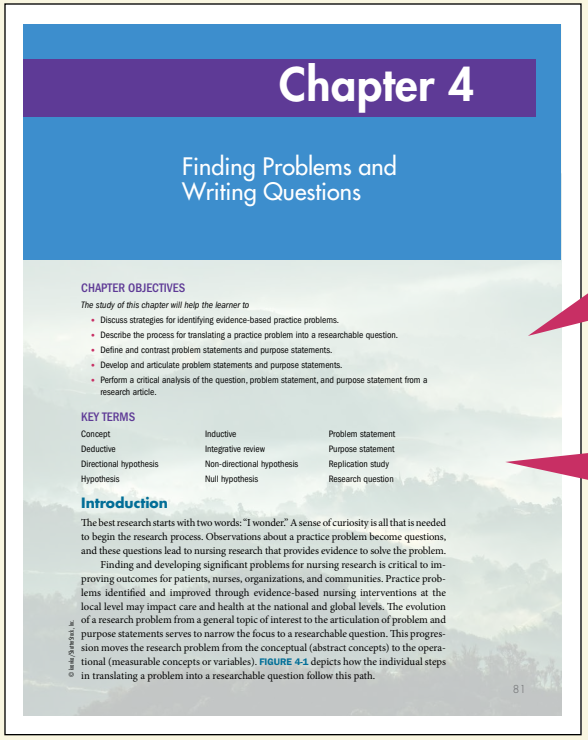
The Pedagogy

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



Chapter 4

Finding Problems and Writing Questions

CHAPTER OBJECTIVES

The study of this chapter will help the learner to

- Discuss strategies for identifying evidence-based practice problems.
- Describe the process for translating a practice problem into a researchable question.
- Define and contrast problem statements and purpose statements.
- Develop and articulate problem statements and purpose statements.
- Perform a critical analysis of the question, problem statement, and purpose statement from a research article.

KEY TERMS

Concept	Inductive	Problem statement
Deductive	Integrative review	Purpose statement
Directional hypothesis	Non-directional hypothesis	Replication study
Hypothesis	Null hypothesis	Research question

Introduction

The best research starts with two words: "I wonder." A sense of curiosity is all that is needed to begin the research process. Observations about a practice problem become questions, and these questions lead to nursing research that provides evidence to solve the problem.

Finding and developing significant problems for nursing research is critical to improving outcomes for patients, nurses, organizations, and communities. Practice problems identified and improved through evidence-based nursing interventions at the local level may impact care and health at the national and global levels. The evolution of a research problem from a general topic of interest to the articulation of problem and purpose statements serves to narrow the focus to a researchable question. This progression moves the research problem from the conceptual (abstract concepts) to the operational (measurable concepts or variables). FIGURE 4-1 depicts how the individual steps in translating a problem into a researchable question follow this path.

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

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

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

VOICES FROM THE FIELD

As soon as I identify an idea for a research project, I start thinking about the legal implications of this study or how this study will look in the eyes of our institutional review board (IRB). When I was a novice researcher, the IRB seemed like a big hurdle to overcome. Now that I am an experienced researcher, I view it as a significant asset to the research process.

The IRB is made up of a wide variety of professionals who evaluate a study from their area of expertise. There is a lot of research experience on the IRB. Its members pay particular attention to the risks and benefits of each study, and it is clear their focus is on protecting the rights of subjects. But they can also give you excellent advice and suggestions to make your study stronger and ensure it is ethical. They also give good feedback about the soundness of the overall study design and the ability of the study team to perform this particular research.

This became very clear to me when I had to consider the legal implications of a recent study that I helped design. The study itself seemed quite benign. The research question was, "Do two 15-minute foot massages done on two consecutive days decrease anxiety in inpatient cancer patients?" We chose to answer this question using a randomized controlled trial (RCT) study design. The two co-primary investigators (PIs) were bedside nurses on our inpatient cancer unit who cared deeply about their patients and wanted to do a study on ways to help lessen the stress of being hospitalized. The study team included an oncologist who was also the chief of oncology services, several clinical nurse specialists, the unit director, an experienced massage therapist, and me in my role as medical epidemiologist and nurse researcher. As a team, we designed a study that we felt adequately addressed our study question.

The IRB saw it differently. They were concerned that we had not adequately addressed the risks of a foot massage; although rare, they still needed to be expressed in both the protocol and the consent process. We needed to inform potential subjects that there was a risk of dislodging a clot, causing severe pain or discomfort, or irritating or damaging the skin. Further, the board suggested that our control group (no massage) would be a better comparison group if we offered some type of therapeutic nurse interaction for the same amount of time as our foot massage. This would help overcome any placebo effect from the treatment. They had concerns about our measurement tools and our enrollment methods as well. Our simple little study suddenly wasn't so simple—and we had to admit their suggested changes would improve the study in a lot of ways.

Instead of becoming discouraged, we took the IRB's recommendations to heart and began to redesign our study. We realized that we needed to better communicate how we had identified and addressed risks in our IRB documents, so we rewrote our consent form. We asked for advice from a variety of sources and wrote a better protocol that included a comparison therapy. We identified a stronger instrument and cleaned up our sampling procedure. In retrospect, I'm relieved we were stopped when we were—we honestly hadn't considered the risks carefully enough, and the IRB made us do that.

In retrospect, we should have asked for feedback from clinical and scientific colleagues outside of our team before submitting our project for IRB review—a lesson learned. Even though it was small and seemingly benign, we needed to be more aware of the risks involved.

Joanna Bokovoy, RN, DrPH
Medical Epidemiologist

Beneficence: A basic principle of ethics that states that persons should have their decisions respected, be protected from harm, and have steps taken to ensure their well-being.

Justice: A basic principle of ethics that incorporates a participant's right to fair treatment and fairness in distribution of benefit and burden.

- The written consent form is understandable given the subject's expected level of function and comprehension.
- Adequate follow-up is provided (Juritzen et al., 2011).

Beneficence

One of the most fundamental ethical principles in research is **beneficence**—that is, "do no harm." According to the Belmont Report,

"Persons are treated in an ethical manner not only by respecting their decisions and protecting them from harm, but also by making efforts to secure their well-being. Two general rules have been formulated as complementary expressions of beneficent actions: (1) do no harm and (2) maximize possible benefits and minimize possible harms." (HEW, 1978, §B.2)

Human subjects can be harmed in a variety of ways, including physical harm (e.g., injury), psychological harm (e.g., worry, stress, and fear), social harm (e.g., loss of friends or one's place in society), and economic harm (e.g., loss of employment). Researchers must strive to minimize harm and to achieve the best possible balance between the benefits to be gained from participation and the risks of being a participant.

The Belmont Report tells us that the assessment of the risks and benefits of a study presents an opportunity to gather comprehensive information about the proposed research. The investigator strives to design a study that will answer a meaningful question. A review committee will determine whether risks inherent in participation are justified. Prospective subjects will make an assessment, based on their understanding of risks and benefits, as to whether to participate in the study.

Justice

The third broad principle found in the Belmont Report is **justice**. The principle of justice incorporates participants' right to fair treatment and fairness in distribution of benefit and burden. According to the report, an injustice would occur when a benefit to which a person is entitled is denied or when some burden is unduly imposed. For example, the selection of research subjects needs to be closely scrutinized to determine whether some subjects (e.g., welfare recipients, racial and ethnic minorities, or persons confined to institutions) are being systematically selected because of their easy accessibility or because of their compromised position. The application of justice also requires that research should not unduly involve persons from groups unlikely to be beneficiaries of the results of the research. However, members of diverse groups also should be included, and not excluded, without a prior knowledge of their suitability to participate.

GRAY MATTER

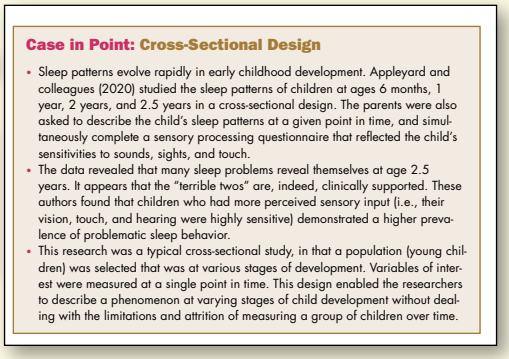
During research, human subjects can suffer harm in the following ways:
- Physically (injury)
- Psychologically (worry, stress, or fear)
- Socially (loss of friends or place in society)
- Economically (loss of employment)

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

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

Case in Point

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

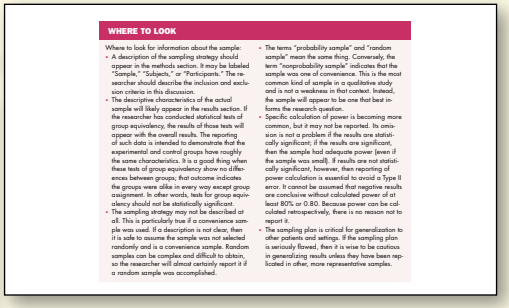


Case in Point: Cross-Sectional Design

- Sleep patterns evolve rapidly in early childhood development. Appleyard and colleagues (2020) studied the sleep patterns of children at ages 6 months, 1 year, 2 years, and 2.5 years in a cross-sectional design. The parents were also asked to describe the child's sleep patterns at a given point in time, and simultaneously complete a sensory processing questionnaire that reflected the child's sensitivities to sounds, sights, and touch.
- The data revealed that many sleep problems reveal themselves at age 2.5 years. It appears that the "terrible twos" are, indeed, clinically supported. These authors found that children who had more perceived sensory input (i.e., their vision, touch, and hearing were highly sensitive) demonstrated a higher prevalence of problematic sleep behavior.
- This research was a typical cross-sectional study, in that a population (young children) was selected that was at various stages of development. Variables of interest were measured at a single point in time. This design enabled the researchers to describe a phenomenon at varying stages of child development without dealing with the limitations and attrition of measuring a group of children over time.

Where to Look

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



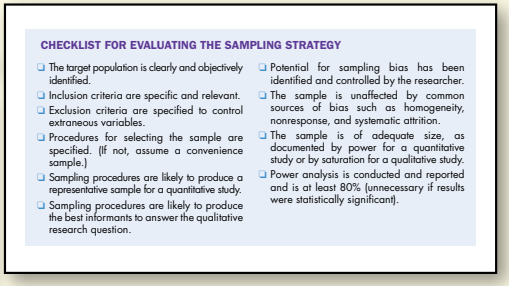
WHERE TO LOOK

Where to look for information about the sample:

- A description of the sampling strategy should appear in the methods section. It may be labeled "Sample," "Subjects," or "Participants." The researcher should describe the inclusion and exclusion criteria in this discussion.
- The descriptive characteristics of the actual sample will likely appear in the results section. If the researcher has conducted statistical tests of group equivalency, the results of those tests will appear with the overall results. The reporting of such data is intended to demonstrate that the experimental and control groups have roughly the same characteristics. It is a good thing when these tests of group equivalency show no differences between groups; that outcome indicates the groups were alike in every way except group assignment. In other words, tests for group equivalency should not be statistically significant.
- The sampling strategy may not be described at all. This is particularly true if a convenience sample was used. If a description is not clear, then it is safe to assume the sample was not selected randomly and is a convenience sample. Random samples can be complex and difficult to obtain, so the researcher will almost certainly report it if a random sample was accomplished.
- The terms "probability sample" and "random sample" mean the same thing. Conversely, the term "nonprobability sample" indicates that the sample was one of convenience. This is the most common kind of sample in a qualitative study and is not a weakness in that context. Instead, the sample will appear to be one that best informs the research question.
- Specific calculation of power is becoming more common, but it may not be reported. Its omission is not a problem if the results are statistically significant; if the results are significant, then the sample had adequate power (even if the sample was small). If results are not statistically significant, however, then reporting of power calculation is essential to avoid a Type II error. It cannot be assumed that negative results are conclusive without calculated power of at least 80% or 0.80. Because power can be calculated retrospectively, there is no reason not to report it.
- The sampling plan is critical for generalization to other patients and settings. If the sampling plan is seriously flawed, then it is wise to be cautious in generalizing results unless they have been replicated in other, more representative samples.

Checklist

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

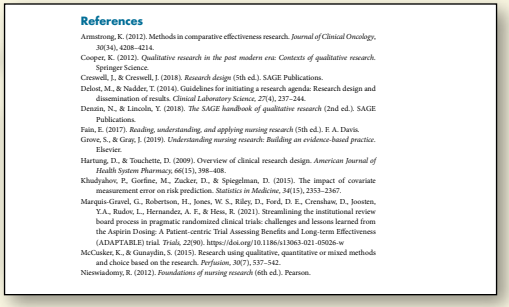


CHECKLIST FOR EVALUATING THE SAMPLING STRATEGY

- ❑ The target population is clearly and objectively identified.
- ❑ Inclusion criteria are specific and relevant.
- ❑ Exclusion criteria are specified to control extraneous variables.
- ❑ Procedures for selecting the sample are specified. (If not, assume a convenience sample.)
- ❑ Sampling procedures are likely to produce a representative sample for a quantitative study.
- ❑ Sampling procedures are likely to produce the best informants to answer the qualitative research question.
- ❑ Potential for sampling bias has been identified and controlled by the researcher.
- ❑ The sample is unaffected by common sources of bias such as homogeneity, nonresponse, and systematic attrition.
- ❑ The sample is of adequate size, as documented by power for a quantitative study or by saturation for a qualitative study.
- ❑ Power analysis is conducted and reported and is at least 80% (unnecessary if results were statistically significant).

For More Depth and Detail

Reference lists are provided for a more in-depth look at the key concepts covered in all chapters.



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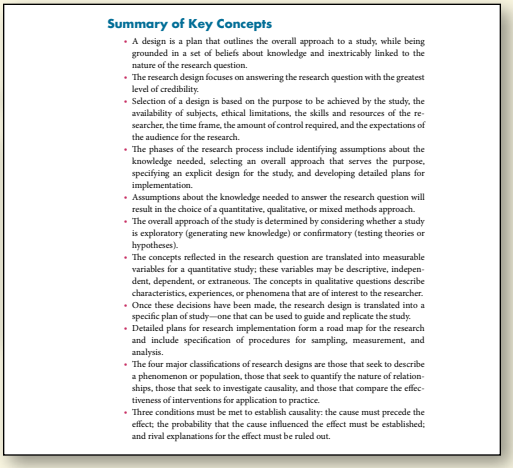
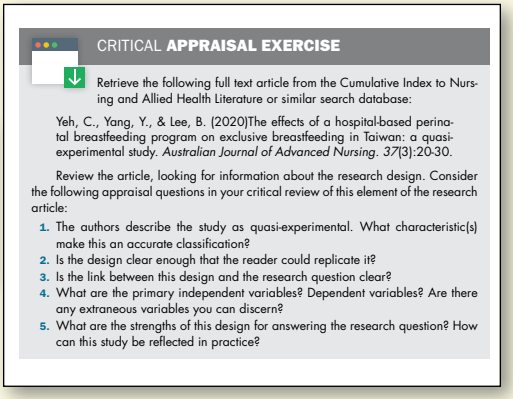
Summary of Key Concepts
Found at the end of each chapter, these lists compile the most pertinent concepts and information for quick review and later reference.



Summary of Key Concepts

- A design is a plan that outlines the overall approach to a study, while being grounded in a set of beliefs about knowledge and inextricably linked to the nature of the research question.
- The research design focuses on answering the research question with the greatest level of credibility.
- Selection of a design is based on the purpose to be achieved by the study, the availability of subjects, ethical limitations, the skills and resources of the researcher, the time frame, the amount of control required, and the expectations of the audience for the research.
- The phases of the research process include identifying assumptions about the knowledge needed, selecting an overall approach that serves the purpose, specifying an explicit design for the study, and developing detailed plans for implementation.
- Assumptions about the knowledge needed to answer the research question will result in the choice of a quantitative, qualitative, or mixed methods approach.
- The overall approach of the study is determined by considering whether a study is exploratory (generating new knowledge) or confirmatory (testing theories or hypotheses).
- The concepts reflected in the research question are translated into measurable variables for a quantitative study; these variables may be descriptive, independent, dependent, or extraneous. The concepts in qualitative questions describe characteristics, experiences, or phenomena that are of interest to the researcher.
- Once these decisions have been made, the research design is translated into a specific plan of study—one that can be used to guide and replicate the study.
- Detailed plans for research implementation form a road map for the research and include specification of procedures for sampling, measurement, and analysis.
- The four major classifications of research designs are those that seek to describe a phenomenon or population, those that seek to quantify the nature of relationships, those that seek to investigate causality, and those that compare the effectiveness of interventions for application to practice.
- Three conditions must be met to establish causality: the cause must precede the effect; the probability that the cause influenced the effect must be established; and rival explanations for the effect must be ruled out.

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



CRITICAL **APPRAISAL EXERCISE**

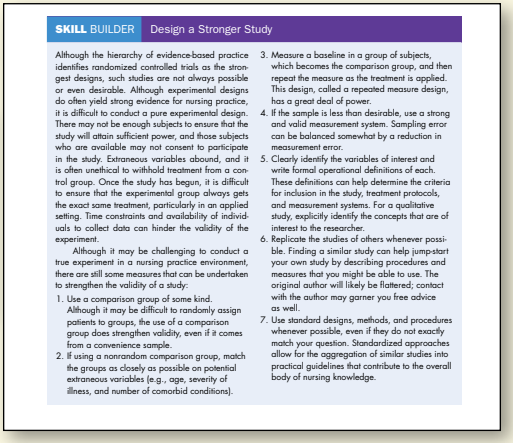
Retrieve the following full text article from the Cumulative Index to Nursing and Allied Health Literature or similar search database:

Yeh, C., Yang, Y., & Lee, B. (2020)The effects of a hospital-based perinatal breastfeeding program on exclusive breastfeeding in Taiwan: a quasi-experimental study. *Australian Journal of Advanced Nursing*. *37*(3):20-30.

Review the article, looking for information about the research design. Consider the following appraisal questions in your critical review of this element of the research article:

1. The authors describe the study as quasi-experimental. What characteristic(s) make this an accurate classification?
2. Is the design clear enough that the reader could replicate it?
3. Is the link between this design and the research question clear?
4. What are the primary independent variables? Dependent variables? Are there any extraneous variables you can discern?
5. What are the strengths of this design for answering the research question? How can this study be reflected in practice?

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



SKILL BUILDER Design a Stronger Study

Although the hierarchy of evidence-based practice identifies randomized controlled trials as the strongest designs, such studies are not always possible or even desirable. Although experimental designs do often yield strong evidence for nursing practice, it is difficult to conduct a pure experimental design. There may not be enough subjects to ensure that the study will attain sufficient power, and those subjects who are available may not consent to participate in the study. Extraneous variables abound, and it is often unethical to withhold treatment from a control group. Once the study has begun, it is difficult to ensure that the experimental group always gets the exact same treatment, particularly in an applied setting. Time constraints and availability of individuals to collect data can hinder the validity of the experiment.

Although it may be challenging to conduct a true experiment in a nursing practice environment, there are still some measures that can be undertaken to strengthen the validity of a study:

1. Use a comparison group of some kind. Although it may be difficult to randomly assign patients to groups, the use of a comparison group does strengthen validity, even if it comes from a convenience sample.
2. If using a nonrandom comparison group, match the groups as closely as possible on potential extraneous variables (e.g., age, severity of illness, and number of comorbid conditions).
3. Measure a baseline in a group of subjects, which becomes the comparison group, and then repeat the measure as the treatment is applied. This design, called a repeated measure design, has a great deal of power.
4. If the sample is less than desirable, use a strong and valid measurement system. Sampling error can be balanced somewhat by a reduction in measurement error.
5. Clearly identify the variables of interest and write formal operational definitions of each. These definitions can help determine the criteria for inclusion in the study, treatment protocols, and measurement systems. For a qualitative study, explicitly identify the concepts that are of interest to the researcher.
6. Replicate the studies of others whenever possible. Finding a similar study can help jump-start your own study by describing procedures and measures that you might be able to use. The original author will likely be flattered; contact with the author may garner you free advice as well.
7. Use standard designs, methods, and procedures whenever possible, even if they do not exactly match your question. Standardized approaches allow for the aggregation of similar studies into practical guidelines that contribute to the overall body of nursing knowledge.

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Contents

Preface

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

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

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

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

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

crucial issues they share. Detailed descriptions of the procedures for each type of design are given attention in separate chapters.

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

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

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

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

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

Acknowledgments

It is a bit misleading to conclude that a text is produced solely by the person whose name appears on the cover. Help and support are needed from many people on both professional and personal fronts to complete a project of this size. The help of Jones & Bartlett Learning editorial staff is immeasurable in combining the author's interests in producing a high-quality text, and the publisher's interests in assuring that someone will want to read it.

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

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Part I

An Introduction to Research

Chapter 1

The Importance of Research as Evidence in Nursing

CHAPTER OBJECTIVES

The study of this chapter will help the learner to

- Define nursing research and discuss how research is used in nursing practice.
- Describe the evolution of nursing research.
- Investigate the roles that nurses play in research processes.
- Contrast research and other types of problem solving.
- Explore how research is used as evidence guiding the practice of nursing.
- Read research and appraise the credibility of the journal, authors, and publication process.

KEY TERMS

Blinded
Evidence-based practice
Evidence-based practice guideline
Journal club
Magnet status
Magnet Recognition status
National Institute of Nursing Research (NINR)
Nursing process
Nursing research
Outcomes measurement
Peer review
Principal investigator
Quality improvement
Randomized controlled trial
Replication
Systematic review

Research as Evidence for Nursing Practice

The practice of nursing is deeply rooted in nursing knowledge, and nursing knowledge is generated and disseminated through reading, using, and creating nursing research. Professional nurses rely on research findings to inform their practice decisions; they use critical thinking to apply research directly to specific patient care situations. The research process allows nurses to ask and answer questions systematically that will ensure that their decisions are based on sound science and rigorous inquiry. Nursing research helps nurses in a variety of settings answer questions about patient care, education, and administration. It ensures that practices are based on evidence, rather than eloquence or tradition.

VOICES FROM THE FIELD

I am a research nurse scientist at a level I safety net hospital. The organization has a clinical ladder for professional development; however, it had not been revised for more than 20 years. The nurse leaders and some of the nurses who engaged in the clinical ladder felt that the program was not adding value to the organization or advancing professional practice. A committee was formed to review the current clinical ladder and improve the program. The hospital typically uses a well-established evidence-based practice (EBP) model to guide practice change.

The first step was to complete a gap analysis of the current program compared with the literature. I conducted a thorough review of the evidence on clinical ladders, also known as professional practice advancement programs. The gap analysis revealed that the original clinical ladder was based on evidence, but over the years, the program had become stale. It no longer aligned with best practices that support nurse engagement and advancement. The gap analysis was shared with nursing leaders and at staff meetings across the organization. A team of diverse bedside nurses, end users of the clinical ladder, were recruited along with two nurse leaders and a human resources representative to form the team that would revamp the clinical ladder program.

Understanding the literature is essential to EBP. The team took the literature search that I had completed and divided the articles among the members. Each member took three articles and over the course of several months, members of the team provided a critical review of the articles. The team discussed the benefits of each article in rebuilding our clinical ladder program. Once the evidence was reviewed by the team, we also sought to understand clinical ladders in similar hospitals. The team developed eight questions based on the evidence review. The chief nursing officer (CNO) provided me with a list of her peers at similar hospitals. I reached out to 20 hospital CNOs for permission for our team to ask about their respective clinical ladder. The bedside nurses on our team completed these calls and responses were entered into a database.

Critical review of the evidence provides understanding and informs strategies for moving best practices forward. Using the evidence summaries and data from the phone surveys, the team began the process of redesigning the clinical ladder program. Several key elements were incorporated into the new process: (1) understanding Benner's model of novice to expert nurse in practice needed to be reflected in the progression steps; (2) the terminal education degree needed to be clearly defined in terms of expectations for advancing within the clinical ladder; (3) the role of the nurse in an administrative leadership role (i.e., charge nurse) or clinical leader (i.e., preceptor) was important to facilitate professional growth that aligned with the nurse's strengths and goals; and (4) the clinical ladder needed to align with the hospital's mission and the department of nursing vision.

Over the course of several months, the team reviewed each item within the current clinical ladder and revised or removed it based on three guiding principles: (1) Was the item reflective of nursing practice? (2) Did the item demonstrate an opportunity for professional growth? and (3) Was the activity value added to the unit/hospital? Once this critique was completed, the expected outcomes for each level of nurse (i.e., level I new to practice to level IV expert nurse) was reviewed. The next step was to evaluate the newly developed clinical ladder with the current program. The team took several previous clinical ladder portfolios and evaluated them using the new criteria. This step was essential because it facilitated a more concrete understanding of how to successfully roll out the new clinical ladder and to allocate resources that would be needed.

The next step in the EBP process was to implement the clinical ladder. The team developed a survey to evaluate the nurses' knowledge and perceptions of the benefits of a clinical ladder for professional growth and advancement. Education sessions and tools were developed to help nurses and mentors understand the new program and expected outcomes for success. Updates were made to the hospital's internal website.

Finally, a steering committee and membership guidelines were developed to facilitate ongoing accomplishments and continuous evaluation of the clinical ladder, optimizing best practices that support professional nurse advancement and recognition.

Mary Beth Flynn Makic, PhD, RN

What Is Nursing Research?

Nursing research is a systematic process of inquiry that uses rigorous guidelines to produce unbiased, trustworthy answers to questions about nursing practice. Research is used as evidence in the evaluation and determination of best nursing practices. Original nursing research aims to generate new knowledge to inform the practice of nursing. More specifically, nurses may use research for the following purposes:

- Synthesize the findings of others into a coherent guide for practice
- Explore and describe phenomena that affect health
- Find solutions to existing and emerging problems
- Test traditional approaches to patient care for continued relevance and effectiveness

Nurse researchers use a variety of methods to generate new knowledge or summarize existing study results. They may measure observable characteristics, solicit perceptions directly from clients, assess words and phrases for underlying meaning, or analyze a group of study findings in aggregate. Nurse researchers have almost limitless options for research design. Moreover, they may assume a variety of roles, ranging from primary investigator for a large, multisite trial to staff nurse in a bedside science project. Nevertheless, the goal is always the same: to generate new knowledge that can be applied to improve nursing practice.

Regardless of the design, research is a rigorous endeavor that is subject to peer review and replication. These two characteristics are essential to ensure that research is unbiased and applicable to the real world. A study is subjected to **peer review** when experts in the field evaluate the quality of the research and determine whether it warrants presentation at a conference or publication in a professional journal. These reviews are generally **blinded**, meaning the reviewer remains unaware of the researcher's identity. In blinded peer review, a research report is subjected to appraisal by a neutral party who is unassociated with the research and unaware of the report's authorship. Reviewers determine whether the study process and outcome are of acceptable quality for communication to the broader professional community. **Replication** ensures that findings can be duplicated in different populations and at different times. This characteristic provides the nurse with confidence that the findings are not limited to a single sample, so that study outcomes will likely be similar in other patient populations.

Nursing research: A systematic process of inquiry that uses rigorous guidelines to produce unbiased, trustworthy answers to questions about nursing practice.

Peer review: The process of subjecting research to the appraisal of a neutral third party. Common processes of peer review include selecting research for conferences and evaluating research manuscripts for publication.

Blinded: A type of review in which the peer reviewer is unaware of the author's identity, so personal influence is avoided.

Replication: Repeating a specific study in detail on a different sample. When a study has been replicated several times and similar results are found, the evidence can be used with more confidence.

Research: A Fundamental Nursing Skill

Magnet Recognition status: A designation for organizations that have characteristics that make them attractive to nurses as workplaces.

Magnet status A designation for organizations that have characteristics that make them attractive to nurses as workplaces.

Although many students and practitioners of nursing consider research to be the purview of academics and graduate students, it is actually fundamental to professional nursing practice. There are many reasons why research is critical for the nurse in any role. Nursing is a profession, and along with advanced education and self-regulation, research is one of the central tenets that defines a profession. For nurses to function on healthcare teams as colleagues with therapists, physicians, and other caregivers, they must speak the language of science and use the best available research evidence as the basis for collaborating in planning patient care.

Consumer demands also require that nurses be held accountable for their practice. Today's consumers and their families are often well informed about the evidence that reveals the effectiveness of care. The Internet has given consumers unprecedented access to health information—some of it questionable, but much of it of high quality—that enables them to evaluate the basis for their own healthcare decisions.

In 2011, the Institute of Medicine issued a seminal report on the future of nursing. In this report, it set a goal that, by 2020, 90% of all clinical decisions would be based on research evidence (Institute of Medicine, 2011). Given that the current estimated rate falls far short of that goal, there is an urgent need for healthcare leaders and clinicians to collaborate in designing and implementing effective strategies for research integration into clinical care.

Many nursing organizations pursue or maintain Magnet Recognition status through the American Nurses Credentialing Center's (ANCC). Magnet Recognition is the most prestigious distinction that a healthcare organization can receive for nursing excellence and quality patient outcomes. Designation requires an institution to demonstrate the adoption of evidence-based practices (EBPs) and involvement of clinical nurses in both conducting research and evaluating it for translation into practice (Nelson-Brantley et al., 2020). Wilson and colleagues (2015) found additional benefits from an organization achieving Magnet status: Nurses in Magnet facilities express greater interest in using evidence in practice, report fewer barriers to implementation of EBP, and used EBP with more frequency than nurses in non-Magnet facilities. However, even with Magnet status, using evidence for practice can be challenging. Melnyk et al. (2020) found that nurses in Magnet facilities had more in-depth knowledge of EBP, perceived supportive cultures for EBP, and experienced more EBP mentoring from senior nurses. Still, their study showed that Magnet nurses struggled with the competencies required to be effective in *using* EBPs. Unfortunately, knowledge does not translate to being competent in EBP. Integration of evidence into daily practice requires both resources and formalized processes; these assets must be evident and useful in a Magnet organization.

Knowledge, a supportive culture, and experienced mentoring are all necessary, but not sufficient, to assure implementation of evidence-based nursing practices. Clearly, the nursing profession has much work to do to achieve broad-based knowledge and competency in the skills of translating research into practice.

The Evolution of Research in Nursing

National Institute of Nursing Research (NINR): A federal agency responsible for the support of nursing research by establishing a national research agenda, funding grants and research awards, and providing training.

Nursing is a relatively young field compared to fields such as philosophy or physics that boast hundreds of years of historical study. Moreover, nursing has not always relied on profession-specific research as a basis for practice. However, as the contemporary nursing literature makes clear, research is taking on fundamental importance as a source of evidence for practice.

More than 150 years ago, Florence Nightingale introduced the concept of scientific inquiry as a basis for nursing practice. Nightingale's work focused on collecting information about factors that affected soldier mortality and morbidity during the Crimean War. Armed with these scientific data, she was able to instigate changes in nursing practice. Indeed, her work was so impressive that she was inducted into the Statistical Society of London.

The years following Nightingale's breakthroughs were marked by relatively little scientific work in nursing, likely because nursing education was accomplished through apprenticeship rather than scholarly work. As more nursing education moved into university settings in the 1950s, however, research took on greater prominence as a key nursing activity. Journals were founded both in the United States and internationally that focused exclusively on publishing nursing research. More outlets for the publication of nursing research were established in the 1970s and 1980s, leading to the communication of research findings to a broader audience. The creation of the National Center for Research for Nursing within the National Institutes of Health (NIH) in 1986 was a seminal step in recognizing the importance of nursing research. In 1993, the center was given full institute status as the National Institute of Nursing Research (NINR). This move put nursing research on an even footing with medical research and the other health sciences, ensuring financial support and a national audience for disciplined inquiry in the field. The NINR and other national agencies guide the overarching research agenda that focuses nursing research on professional priorities. The mission of the NINR is to promote and improve the health and quality of life of individuals, families, and communities. To achieve this mission, the agency supports and conducts clinical and basic research on health and illness so as to build the scientific foundation for clinical practice (NINR, 2016).

In the 1980s and 1990s, leaders in nursing research met periodically at the Conference on Research Priorities in Nursing Science (CORP) to identify research priorities for the nursing profession. These priorities were established as 5-year agendas. The plan began in 2013 with the "Innovative Questions Initiative." This initiative solicited input on future research directions from scientists, clinicians, and the general public, through scientific workshops and a public website. Through the initiative, the NINR sought out ideas that would incite new thinking and creativity in nursing science, develop novel ways to explore root causes of health problems, and promote outcome-oriented research. The initiative resulted in a series of research questions posted on the NINR website as a resource for the scientific

community (NINR, 2016). The future research direction of the NINR includes four areas of scientific focus:

- 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

The NINR identified an additional two cross-functional areas vital to advancing nursing science:

- Promoting innovation: technology to improve health
- Twenty-first-century nurse scientists: innovative strategies for research careers

These areas of scientific focus provide the framework for the NINR's support of nursing research and nurse researchers. These are the areas of science in which the needs are greatest and for which support for science can have the largest impact. It provides guidelines for funding, as well as reaffirming NINR's long-standing commitment to developing the next generation of nurse scientists.

GRAY MATTER

Research is critical in nursing for the following reasons:
- The use of research is inherent to the definition of a profession.
- Nurses are accountable for outcomes.
- Consumers are demanding evidence-based care.

GRAY MATTER

Nurses may play a variety of roles in research, including the following:
- Informed consumer of research
- Participant in research-related activity, such as journal clubs
- Contributor to a systematic review
- Data collector for a research project
- Principal investigator for a research study

The 1990s and the early 21st century saw a shift in emphasis from research as an academic activity to research that serves as a basis for nursing practice. The impetus for this shift was partially due to external influences that created demands for accountability, effectiveness, and efficiency. Internal influences in the profession also played a key role in this shift, as nursing professionals strive to create a norm of professional practice that is firmly grounded in best demonstrated practice.

Contemporary Nursing Research Roles

The nurse may be an effective team member on any number of research projects and may take on responsibilities ranging from data collection to research design. The broad number of potential roles in the research setting provides nurses with the chance to participate at their individual comfort level while learning increasingly complex research skills. The professional clinician has both opportunities and responsibilities to use research in a variety of ways to improve practice. **Table 1-1** contains the statement from the American Association of Colleges of Nursing (AACN, 2006) that describes the expected roles of nurses in research processes.

In 2020, the AACN issued this position statement on EBP:

"The best available evidence should guide all healthcare decisions. This is true for the individual healthcare professional at a patient's bedside and for civic leaders who make local, state, and federal healthcare policy. Even when fast-moving public health crises make it impossible to find sufficient amounts of peer-reviewed research, public

Table 1-1 Research Expectations for Nurses

Educational Level	Research Role
Baccalaureate degree	Have a basic understanding of the processes of research. Apply research findings from nursing and other disciplines to practice. Understand the basic elements of evidence-based practice. Work with others to identify research problems. Collaborate on research teams.
Master's degree	Evaluate research findings to develop and implement EBP guidelines. Form and lead teams focused on evidence-based practice. Identify practices and systems that require study. Collaborate with nurse scientists to initiate research.
Practice-based doctorates	Translate scientific knowledge into complex clinical interventions tailored to meet individual, family, and community health and illness needs. Use advanced leadership knowledge and skills to translate research into practice. Collaborate with scientists on new health research opportunities.
Research-focused doctorates	Pursue intellectual inquiry and conduct independent research for the purpose of extending knowledge. Plan and carry out an independent program of research. Seek support for initial phases of a research program. Involve others in research projects and programs.
Postdoctoral programs	Devote oneself fully to establishing a research program and developing as a nurse scientist.

Modified with permission from American Association of Colleges of Nursing. (2006). *AACN position statement on nursing research*. Author.

policy decisions must be based on carefully evaluated healthcare information and the guidance of fully qualified experts." (AACN, 2020)

The AACN further added recommended actions for all nurses regarding research and EBP. They recommend that all nurses:

- Use EBP, a problem-solving approach that involves the conscientious use of current best evidence, in making decisions about patient care.
- Be aware of conflicts of interest—professional, financial, or political—when evaluating data and evidence.
- Correct false healthcare information at every opportunity among your peers, your neighbors, or your loved ones. The general public may lack your expertise in evaluating evidence.
- Be ardent defenders of evidence-based science and respect for expert knowledge, especially when these are attacked for commercial or political gain.
- Speak out against censorship of scientific ideas or the silencing of legitimate experts who provide advice for the betterment of public health.

Most nurses are first exposed to clinical research as informed consumers. The informed consumer of research is able to find appropriate research studies, read them critically, evaluate their findings for validity, and use the findings in practice. Nurses may also participate in other types of research-related activities, including **journal clubs** or groups whose members meet periodically to critique published studies or care standards. Journal clubs are relatively easy to implement and have been demonstrated to be one of the most effective means for sustaining staff nurse enthusiasm for and participation in EBP implementation (Gardner et al., 2016). Staff nurses in particular are welcomed on organizational EBP committees, and participating often requires just the simple act of volunteering. Attending research presentations and discussing posters at conferences also expose nurses to a variety of research studies.

As the nurse becomes more proficient in the research process, involvement in a **systematic review** is a logical next step. Conducting a systematic review that results in an **evidence-based practice guideline** requires the ability to develop research questions methodically, write inclusion criteria, conduct in-depth literature searches, and review the results of many studies critically. Participation in such activities also facilitates changes in clinical practice on a larger scale and requires the nurse to use leadership and communication skills.

Involvement in actual research studies does not require complete control or in-depth design abilities. Indeed, assisting with data collection can take the form of personally participating as a subject or helping measure outcomes on subjects.

Clinicians are frequently recruited as subjects in research studies. One of the most important in the last 50 years is focused on nurses as subjects. Referred to simply as the Harvard Nurses' Health Studies, the three phases of this longitudinal study are among the largest prospective investigations into the risk factors for major chronic diseases in women.

Starting with the original Nurses' Health Study in 1976, the studies are now in their third generation with Nurses' Health Study 3 and count more than 275,000 participants. Nurses were selected as the study population because of their knowledge about health and their ability to provide complete and accurate information regarding various diseases.

Journal club: A formally organized group that meets periodically to share and critique contemporary research in nursing, with a goal of both learning about the research process and finding evidence for practice.

Systematic review: A highly structured and controlled search of the available literature that minimizes the potential for bias and produces a practice recommendation as an outcome.

Evidence-based practice guideline: A guide for nursing practice that is the outcome of an unbiased, exhaustive review of the research literature, combined with clinical expert opinion and evaluation of patient preferences. It is generally developed by a team of experts.

Due to their unique strengths, including regular follow-up of study participants since 1976 and repeated assessment of health and lifestyle factors, the studies have played an instrumental role in shaping public health recommendations (Nurses' Health Study, 2020).

Collecting data for the studies of other researchers can give the nurse valuable insight into the methods used to maximize reliability and validity—experience that will help the nurse later if they choose to design an experiment.

Most nurses do not immediately jump into research by undertaking an individual research study, but rather *serve on a research team* as an initial foray into this area. As part of a team, the nurse can learn the skills needed to conduct research while relying on the time and expertise of a group of individuals, some of whom may be much more experienced researchers. Serving on a team in this way gives the nurse the opportunity to participate in research in a collegial way, collaborating with others to achieve a mutual goal.

A contemporary means for enhancing staff nurse participation in research is through adoption of the clinical scholar or nurse scholar role. Nurse scholar programs typically seek out clinical nurses for specialized training in research and EBP. These nurses are then provided with releases from their usual workloads so that they can identify evidence-based problems, design studies to answer clinical questions, and carry out EBP projects. One study found that a nurse scholar program increased the number of EBP projects by as much as 10 times, led to significant practice improvements, and enhanced the confidence of the clinical nurses who participated in EBP development (Crabtree et al., 2016). Chlan and colleagues (2020) identified two kinds of scholar programs that can be effective in improving EBP uptake: For staff nurses, a Clinical Nurse Scholar Program can provide clinical nurses the opportunity to design and conduct a research study under the mentorship of a senior nurse scientist. For advanced-practice nurses, a Nursing Research Scholar Program provides support during and immediately after graduate school to apply their enhanced research training and acquire new research skills.

The most advanced nurses may serve as **principal investigators**, or producers of research, who design and conduct their own research projects. Because individuals are rarely able to accomplish research projects on their own, it is more likely that the nurse will lead a research team. This role requires not only research and analytic skills, but also skills in leading groups, managing projects, and soliciting organizational commitment.

Research Versus Problem Solving

Research is distinct from other problem-solving processes. Many processes involve inquiry. In an organizational setting, **quality improvement**, performance improvement, and **outcomes measurement** all involve systematic processes and an emphasis on data as a basis for decisions. For an individual nurse, the **nursing process** requires that the nurse gather evidence before planning an intervention and subsequently guides the nurse to evaluate the effectiveness of care objectively. Although both organizational and individual problem-solving processes may be systematic and objective, these are not synonymous with research in intent, risks, or outcome (Lee et al., 2013). The correct identification of the type of inquiry that is being conducted and reported will help the nurse link the outcome to the appropriate level of practice recommendation (Baker et al., 2014).

Principal investigator: The individual who is primarily responsible for a research study. The principal investigator is responsible for all elements of the study and is the first author listed on publications or presentations.

Quality improvement: The systematic, data-based monitoring and evaluation of organizational processes with the end goal of continuous improvement. The goal of data collection is internal application rather than external generalization.

Outcomes measurement: Measurement of the end results of nursing care or other interventions; stated in terms of effects on patients' physiological condition, satisfaction, or psychosocial health.

Nursing process: A systematic process used by nurses to identify and address patient problems; includes the stages of assessment, planning, intervention, and evaluation.

The intent of quality improvement is to improve processes for the benefit of patients or customers within an organizational context. Studies in this area are often undertaken to determine if appropriate and existing standards of care are practiced in a specific clinical setting (Baker et al., 2014). Quality improvement is basically a management tool that is used to ensure continuous improvement and a focus on quality. Research, in contrast, has a broader intent. Its goal is to benefit the profession of nursing and to contribute to the knowledge base for practice. Research benefits more people because it is broadly applied; quality improvement is beneficial simply because of its specificity to a single organization.

The risk for a subject who participates in a quality-improvement study is not much more than the risk associated with receiving clinical care. Such studies are frequently descriptive or measure relationships that are evidenced by existing data. Often, patients who are the subjects of study for a quality-improvement project are unaware they are even part of a study. In contrast, in a research project, subjects are clearly informed at the beginning of the project of the risks and benefits associated with participating in the study, and they are allowed to withdraw their information at any time. Upfront and informed consent is central to the research process.

Finally, the outcomes of a quality-improvement study are intended to benefit a specific clinical group and so are reviewed by formal committees and communicated internally to organizational audiences. In contrast, research findings are subjected to rigorous peer review by neutral, external reviewers, and the results are expected to stand up to attempts to replicate them. When quality-improvement projects are planned with an expectation of publication, the distinction becomes less clear. Is the goal of publication to share a perspective on a process or to generalize the results to a broader group of patients? If the latter goal is targeted, then quality-improvement projects should be subjected to the same rigorous review and control as a research project.

The intent when an individual nurse applies the nursing process for problem solving is even more specific. The nursing process requires an individual nurse to gather data about a patient, draw conclusions about patient needs, and implement measures to address those needs. Data collected from the patient are used to evaluate the effectiveness of care and make modifications to the plan. These steps mirror the research process but take place at an individual level. Research is useful within the nursing process is a source of knowledge about assessment procedures, problem identification, and effective therapeutics, but simply using the nursing process does not constitute research.

GRAY MATTER

The research process is distinct from other problem-solving processes in the following respects:

- Research contributes to the profession of nursing as a whole, not just a single organization or patient.
- Research involves an explicit process of informed consent for subjects.
- Research is subjected to external peer review and replication.

Research as Evidence in Nursing Practice

Evidence-based practice: The use of the best scientific evidence, integrated with clinical experience and incorporating patient values and preferences in the practice of professional nursing care.

It would seem a foregone conclusion that effective nursing practice is based on the best possible, most rigorously tested evidence. Yet it is only in the last two decades that an emphasis on evidence as a basis for practice has reached the forefront of professional nursing. Although it may be surprising that the scientific basis for nursing practice has been so slow to be accepted, many reasons exist to explain why evidence-based nursing practice is a relatively recent effort. The last decade has seen unprecedented advances in information technology, making research and other types of evidence widely available to healthcare practitioners. Whereas a nurse practicing in the 1980s might have read one or two professional journals per month and attended perhaps one clinical conference in a year, contemporary nursing professionals have access to an almost unlimited array of professional journal articles and other sources of research evidence via the Internet. Technology supports the communication of best practices and affords consumers open access to healthcare information as well. As a result, EBP is quickly becoming the goal for effective nursing practice.

Evidence-Based Practice

What Evidence-Based Practice IS

Evidence-based practice is the use of the best scientific evidence, integrated with clinical experience and incorporating patient values and preferences in the practice of professional nursing care. All three elements in this definition are important. As illustrated in **FIGURE 1-1**, the triad of rigorous evidence, clinical experience, and patient preferences

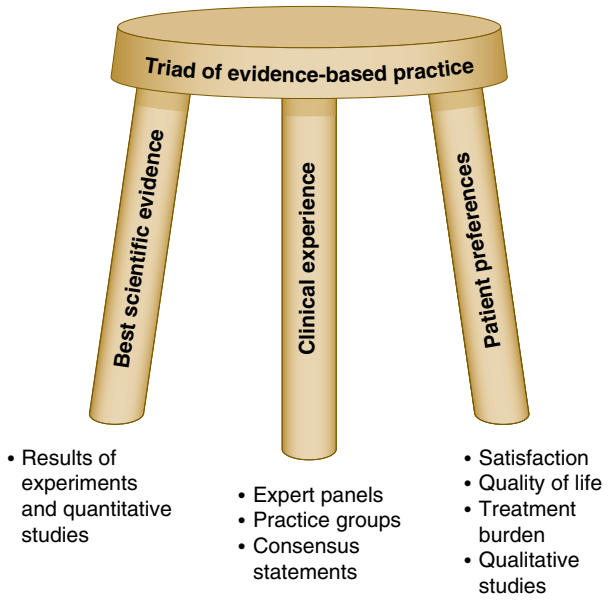

FIGURE 1-1 The Triad of Evidence-Based Practice

Randomized controlled trial: An experiment in which subjects are randomly assigned to groups, one of which receives an experimental treatment while another serves as a control group. The experiment has high internal validity, so the researcher can draw conclusions regarding the effects of treatments and generalize them to larger populations.

must be balanced to achieve clinical practices that are both scientifically sound and acceptable to the individuals applying and benefiting from them.

Although healthcare practitioners have long used research as a basis for practice, a systematic approach to the translation of research into practice has emerged only in relatively recent times. The impetus for EBP was a 1990 comment by a Canadian physician on the need to "bring critical appraisal to the bedside." The first documented use of the term *evidence-based practice* appeared in 1991, when a clinical epidemiology text used the term to describe the way that students in medical school were taught to develop an attitude of "enlightened skepticism" toward the routine application of diagnostic technologies and clinical interventions in their daily practice (Sackett et al., 1991). The authors described how effective practitioners rigorously review published studies to inform clinical decisions. The goal, as stated in this publication, was to achieve an awareness of the evidence on which professional practice is based and a critical assessment of the soundness of that evidence.

The term entered the U.S. literature in 1993 when an article in the *Journal of the American Medical Association* described the need for an established scientific basis for healthcare decisions (Oxman et al., 1993). The authors of the article noted that the goal of EBP is to help practitioners translate the results of research into clinical practice, and they recognized that the scientific practice of health care required sifting through and appraising evidence to make appropriate decisions.

EBP has rapidly evolved into an international standard for all healthcare practitioners. Using the best scientific evidence as a basis for practice makes intuitive sense and places nursing in the company of the other science-based health professions in using evidence as a foundation for clinical decision making.

What Evidence-Based Practice Is NOT

A wide range of activities contribute to EBP. Many of these activities—such as reviewing research, consulting expert colleagues, and considering patient preferences—are common in nursing practice. Even so, many such activities are not considered EBP, but rather other forms of decision making used to solve problems.

Evidence-Based Practice Is Not Solely Randomized Controlled Trials

EBP does not mean choosing only those interventions supported by randomized controlled trials—although these studies are clearly important in providing guidance for effective practices. A somewhat tongue-in-cheek article by Smith and Pell (2006) suggested that we did not need a randomized trial to inform practitioners of the importance of a parachute as a measure of preventing death when jumping from an airplane (and, in fact, noted the difficulty in recruiting a control group for such a trial!). EBP does not rely solely on one type of evidence, but rather is founded on a hierarchy of evidence, with individual studies rated on a scale from "strongest" to "weakest" based on the type of design and quality of execution. Evidence can come from many different types of studies in addition to randomized trials.

Evidence-Based Practice Is Not "Cookbook Medicine"

The existence of guidelines based on the best available evidence does not mean that the practitioner has an edict to practice in a single way. In fact, evidence alone is never sufficient to make a specific clinical decision about a specific patient. The nurse needs evidence plus good judgment, clinical skill, and knowledge of the patient's unique needs to apply evidence to a specific patient care situation. The definition of EBP, in fact, holds evidence as only one element of the triad of decision making; that is, clinical judgment and patient values must also be considered when applying the evidence to a particular situation.

Evidence Is Not the Same as Theory

Theoretical effects must be tested and retested before therapies can be determined to be effective. As late as the early 20th century, physicians still believed that bloodletting was an effective treatment for a host of disorders. This belief was based on the empirical observation that a patient's pulse rate slowed when they were bled and the theory that a slower pulse reduced irritation and inflammation. Although the empirical observations were accurate—the patient's pulse would certainly slow when bloodletting was performed, but due to impending hypovolemic shock—the theoretical relationship to a therapeutic response was ill founded. Many contemporary healthcare interventions are, unfortunately, based on similar theoretical relationships that have been untested for years. Recent research has refuted many of these theoretical assumptions, including the protective value of hormone-replacement therapy, the use of rubbing alcohol to prevent infection in a neonate's umbilical cord, and the use of heat to treat acute inflammation, among many others.

Evidence-Based Nursing Is Not Evidence-Based Medicine

The nature and processes of research are likely to be unique for any given profession. In the health realm, medicine and nursing have different philosophical roots and approaches to patient care. Medicine relies on an extensive scientific knowledge base that is primarily concerned with the cause of disease and effects of treatment. The evidence for medical care, by necessity, focuses on scientific studies that quantify these effects. Nevertheless, medical evidence has been criticized for its sometimes-artificial nature. It is a research paradox that the more an experiment is controlled, the less applicability the results will have in the real world. Randomized controlled trials, then, may provide the most rigorous scientific evidence, but that evidence may not apply very well to individual patients with a broad range of physical, psychological, and behavioral conditions.

Nursing, in contrast, requires a holistic approach to the care of individuals with physical, psychosocial, and/or spiritual needs. This care is founded on the nurse–patient relationship and the nurse's appreciation for the patient's unique needs. The evidence for nursing care, then, requires a broad range of methodologies as a basis for care. This is not to imply that these sources of evidence are not subjected to healthy skepticism and systematic inquiry, but rather that a broader range of evidence is considered as a basis for practice.

The Importance of Evidence-Based Practice in Nursing

EBP is important to the nurse for many reasons. At the top of this list is the contribution of evidence to the effective care of patients. Studies have supported the contention that patient outcomes are substantially improved when health care is based on evidence from well-designed studies versus tradition or clinical expertise alone. Evidence has been shown to be effective in supporting practices that achieve optimal outcomes in a range of behavioral, physiological, and psychosocial outcomes. In one meta-analysis, Leufer and Cleary-Holdforth (2009) aggregated outcomes studies related to EBP changes. A wide range of effects was found in multiple specialties including orthopedic, cardiovascular, respiratory, and obstetric outcomes. EBPs in obstetrics and neonatal care reduced morbidity and mortality, sometimes dramatically. The use of corticosteroids in premature labor, for example, reduced the risk of premature infant death by 20%. In another study, Deighton et al. (2016) demonstrated an association between EBPs and mental health

Evidence-Based Practice In the Time of COVID-19

At no time has the importance of basing practice on evidence been more prominent than during the COVID-19 pandemic. As one public health official lamented, "We're building the plane while we're flying it," as scientists and practitioners globally learned as much about the virus, its transmission, and its treatment as fast as they could. Unprecedented sharing of samples, findings, and recommendations resulted in an example of how quickly evidence can become disseminated with enough resources and focus. Still, contradictory findings, the prominence of rumors shared on social media, and the sheer fear of a nation made finding reliable evidence a tough proposition.

Mary Beth Flynn Makic, PhD, whose voice starts this book, answers the question "How do we provide evidence-based practice during the coronavirus disease pandemic?" This was at a time when nurses everywhere were overwhelmed with the care needs of their critical patients, who were often isolated from family and dying.

Makic (2020) argues that seeking and relying on credible sources of evidence is the only way to combat fear and hysteria during times of sustained stress. Even though evidence for treatment of COVID-19 was emergent and often poorly tested, nursing care of these patients required "reliance on the essential elements of care that nurses deliver. Critical care nurses know how to treat acute respiratory disorders, safely practice isolation procedures, manage the safe delivery of complex medication protocols, and communicate with families to ensure they understand their care." These EBPs were translated to the care of COVID-19 patients, as disease-specific evidence emerged. Even in unprecedented times, innovations to overcome healthcare challenges can be rapidly developed through collaboration and rapid research translation.

While the treatment of these complex patients was dependent upon many variables, the fundamental principles of evidence-based care continued to inform nursing care. "Use reliable sources," Makic says. "Will we always find highly definitive and scientifically proven answers at this moment? No. But we can ask the questions that help us determine whether to rely on the rapidly evolving evidence."

outcomes, particularly for interventions related to the treatment of emotional disorders. The linkage between EBPs and outcomes is an important one, and determining the scientific support for a practice prior to its implementation makes intuitive sense.

Today's healthcare providers operate in an era of accountability, in which quality issues, patient safety, and cost concerns are primary drivers of patient care processes (Markon et al., 2013). Practices that are unnecessary are eliminated; ineffective practices are replaced with practices that result in desired outcomes.

Existing practices may even be unintentionally harming patients (as was found in hormone-replacement studies), so it is ethically unjustified to continue using untested interventions. Evidence can help healthcare professionals avoid errors in decision making relative to patient care. Using research decreases the need for trial and error, which is time-consuming and may prove counterproductive. In any case, time is not wasted on practices that may be ineffective or unnecessarily time intensive.

Today's consumers are well informed about their options for personal health care and often resist the traditional, paternalistic approach to health interventions. The public expects that care will be based on scientific evidence and believes that care processes should routinely lead to high-quality outcomes that are physically and mentally desirable. Healthcare professionals, in turn, must be able to respond to their patients' questions about the scientific merit of interventions and about the relative benefit of treatment options.

GRAY MATTER

EBP is important in nursing practice because research has shown that
- Patient outcomes are better when evidence is used as a basis for practice.
- Nursing care is more efficient when ineffective processes are replaced.
- Errors in decision making become less frequent with EBP.
- Consumers want evidence-based information to make decisions.

Evidence can take a variety of forms—journal articles, policies, guidelines, professional consensus statements, and standards of practice, as well as formalized research. Although EBP implies scientific evidence, the words *relevant* and *rigorous* might be better adjectives to describe the kind of evidence needed by healthcare professionals. Critical skills include the ability to judge both the *type of evidence* that is needed and the *value of that evidence*.

Healthcare practitioners do not practice in professional isolation, but rather explore what works and does not work using empirical methods. An increased emphasis on EBP can be viewed as a response to these broader forces influencing the context of healthcare delivery and as a logical progression toward the utilization of research as a basis for patient care decisions.

How Can Evidence Be Used in Health Care?

At its best, evidence provides the basis for effective, efficient patient care practices. At a minimum, an evidence-based approach can enhance practice by encouraging reflection

on what we know about almost every aspect of daily patient care. The EBP process need not be onerous, because it basically entails just six elements: (1) ask a relevant clinical question, (2) search for the best evidence in the literature, (3) critically appraise the evidence, (4) integrate the evidence with clinical experience and client preferences, (5) evaluate the outcome of the practice change, and (6) disseminate the outcome (Facchiano & Snyder, 2012). The original question can come from a variety of sources in a healthcare setting; likewise, evidence can improve outcomes for a wide range of organizational processes.

Evidence as a Basis for Healthcare Processes

Evidence can be incorporated into virtually every phase of the healthcare process. For example, evidence exists for best practices in the following areas:

- Assessment of patient conditions
- Diagnosis of patient problems
- Planning of patient care
- Interventions to improve the patient's function or condition, or to prevent complications
- Evaluation of patient responses to intervention

Evidence as a Basis for Policies and Procedures

Although healthcare professionals from different educational programs, backgrounds, and experience may have different ways of delivering patient care, few can argue with the need for best practices. EBP provides the foundation for policies and procedures that are tested and found effective, as opposed to "the way we've always done it."

Evidence as a Basis for Patient Care Management Tools

The evidence that is revealed through systematic review of research and other sources provides an excellent basis for patient care management tools such as care protocols, procedure manuals, and standard order sets.

Evidence as a Basis for Care of the Individual

The complexity of patients who need care in the healthcare system can make the clinician wonder if evidence can ever be applied to an individual patient. It is easy to consider the question, "Is my patient so different from those in the research that results will not help me make a treatment decision?" This question, more than any other, may stand in the way of applying evidence to individual patient care situations. As practitioners, we must ask whether these assumptions about the uniqueness of patients are in their best interests when it comes to clinical care. Uncertainty is inherent in the healthcare process; evidence helps to quantify that uncertainty. Concern for the uniqueness of the individual patient is not a reason to ignore the evidence, but rather an impetus to learn to apply the evidence both critically and appropriately. Evidence is not intended to be rigid, but rather—as our definition makes explicit—to be *integrated* with clinical experience and a patient's unique values to arrive at optimal outcomes.

Evidence in clinical practice is not solely limited to patient care, however. Healthcare professionals might be interested in evidence as it relates to team functioning, the

best way to communicate change, organizational models for research utilization, or even the effects of insurance on healthcare usage. Evidence in health care abounds on a variety of topics, and research utilization can improve patient care in a multitude of ways.

GRAY MATTER

Evidence can be used as a basis for the following aspects of nursing practice:

- Nursing care processes such as assessment, diagnosis, treatment, and evaluation
- Policies and procedures that guide nursing practice within an organization
- Patient care management tools such as care protocols, procedure manuals, and standard order sets
- Care decisions regarding individual patient needs

Barriers for Implementing Evidence-Based Practice

Considering the benefits of basing clinical nursing practice on evidence, it would make sense for evidence-based nursing practice to be the norm. Unfortunately, this is not the case. In an integrative review conducted by Saunders and Julkunen (2016), the vast majority of nurses were found to *believe* in the value of EBP in improving care quality and patient outcomes. Even so, most of the nurses considered their own knowledge and skills insufficient for employing EBP and did not believe they were using evidence as a basis for their own practice. Inadequate knowledge and skills remain the most commonly cited obstacles for EBP implementation (Ost et al., 2020). Finding adequate mentors is also a challenge, as is the perception that EBP is time-consuming—and often it is.

While the knowledge and competencies needed to implement EBP in clinical practice are difficult to obtain, there are many reasons why EBPs are the exception rather than the rule, including limitations created by the requirements of EBP systems themselves. Some barriers are related to human factors, whereas others are related to the organizations within which nursing care is delivered. **Table 1-2** lists some of the common barriers to using evidence as a basis for practice.

Organizations do not commonly have systems in place to support clinicians in the development of EBP tools. The impact of the organization's culture is a strong one; in one study, nurses reported that their colleagues' lack of support for changing practice was one of the most formidable barriers to EBP (Williams et al., 2015). A collaborative workplace where questioning of current practices is encouraged is needed for wide-scale adoption of EBPs, yet it remains the exception rather than the rule.

An additional barrier identified in the study by Williams et al. (2015) was the lack of authority to change practices in a hierarchical organization. These researchers found that top-down organizations and those in which nurses had little autonomy were the least likely to have a widespread EBP culture. For evidence-based solutions to be translated into consistent practices, nurse leaders must both value and model the use of EBP for empowered decision making. To implement EBP effectively, all nurses must believe

Table 1-2 Barriers to Using Evidence in Clinical Practice

Limitations in evidence-based practice systems	Overwhelming amount of information in the literature Sometimes contradictory findings in the research
Human factors that create barriers	Lack of knowledge about evidence-based practice Lack of skill in finding and/or appraising research studies Negative attitudes about research and evidence-based care Patient expectations (e.g. demanding antibiotics)
Organizational factors that create barriers	Hierarchical structures that do not encourage autonomous decision making Lack of authority for clinicians to make changes in practice Colleagues' lack of support for practice change Demanding workloads with no time for research activities Lack of administrative support or incentives

that their inputs and ideas are valued, and must perceive that they have a level of power appropriate to enact changes within their practices.

An updated review of the literature from 2010 to 2015 conducted by Mallion and Brooke (2016) yielded more heartening findings. These researchers discovered that the traditional barriers of lack of time, knowledge, and skill continue to affect the wholesale adoption of EBPs, but that nurses' attitudes toward EBP had changed over time. While still acknowledging the difficulty inherent in continuously adopting EBP, the nurses in these studies included in Mallion and Brooke's literature review valued evidence and had positive impressions of their ability to improve practice.

While there are seemingly insurmountable barriers to implementing EBP, it is absolutely essential that, as a profession, we do so. Systematically identifying barriers is the first step; finding ways to overcome them is the next.

Strategies for Overcoming Barriers

Although little can be done to reduce the complexity of contemporary clinical care, some strategies can be undertaken to improve the rate at which healthcare professionals utilize research as a basis for their practice.

Begin the process by specifically *identifying the facilitators of and barriers to evidence-based practices*. Use of a self-assessment tool such as that tested by Gale and Schaffer (2009) can help identify organizational strengths and limitations in preparation for an EBP effort.

Education and training can improve knowledge and strengthen practitioners' beliefs about the benefits of EBP. Clinicians may fear that they will appear to lack competence if they engage in EBP, and greater knowledge will give them confidence in determining an evidence base for their practice.

One of the most helpful—and difficult—strategies is to *create an environment that encourages an inquisitive approach* about clinical care. The first step in identifying opportunities for best practices is questioning current practice. This can be

accomplished by creating a culture in which EBP is valued, supported, and expected, and in which nurses have the authority and autonomy to change practices within their scope of care.

Florczak (2016) has even more basic recommendations for improving research uptake: Nurse researchers, first and foremost, need to conduct studies that are of high quality, especially in terms of sampling methods and controls. Nurses will not be confident about incorporating evidence into practice unless that evidence is strong and convincing. Studies chosen by nurse researchers should focus on outcomes relevant to practice, in which considerations related to patient response, nurse burden, and costs are addressed in addition to effectiveness. Researchers are well advised to collaborate with practitioners and patients in the design of studies and recommendations intended for application to practice.

Despite the barriers inherent in implementing EBP in clinical practice, it is imperative that nurses create structures and processes that reduce these obstacles. Regardless of the system within which the clinician practices, a systematic approach can be employed to find and document the best possible evidence for practice. This process involves defining a clinical question, identifying and appraising the best possible evidence, and drawing conclusions about best practice.

Reading Research for Evidence-Based Practice

Reading research as evidence requires that the professional nurse has a basic understanding of research processes and can apply that understanding to the critical appraisal of individual studies. This systematic process of assessing the reliability, validity, and trustworthiness of studies is explored in detail throughout this text. The appraisal process begins by determining whether the journal, authors, and publication process are credible.

Consider the following key issues when assessing credibility:

- Does the author have the appropriate clinical and educational credentials for the research study? If not, have team members been recruited who have the requisite knowledge and skill? Teams strengthen the results of a research project by providing a diversity of perspectives and enlarging the expertise that is accessible to the team members.
- Is there evidence of a conflict of interest that might introduce bias into the study? For example, does the financial sponsor of the study have something to gain from positive or negative results? Sponsors may unintentionally impose their own expectations on a study that may introduce bias into the study. Do the authors have an association with any of the entities in the study? If the authors are employed by an agency being tested in the study, then researcher bias might potentially influence the interpretation of data or the selective reporting of findings.
- Is the journal unbiased? In other words, does the publication have anything to gain by publishing positive or negative results? The publication should have an external editorial board and a cadre of reviewers who are not associated

financially with the publication. The names and credentials of the editorial board should be accessible in the publication.

- Has the research study undergone blinded peer review? Blinded peer review enables a critical appraisal of the research study by a neutral party who is not influenced by the stature (or lack of it) of the authors.
- Has the study been published within a reasonable time frame? Health care is characterized by a rapidly changing clinical environment, and studies whose publication is delayed may be outdated before they reach print. Many journals note the date on which a manuscript was received and the length of time until it was reviewed and accepted. This type of notice enables the reader to determine if the information in the study is contemporary or subject to historical effects.

It is sometimes difficult to determine whether a journal is peer reviewed. This policy may be explicitly stated in the front of the journal, but the absence of such a description does not mean the journal is not a scholarly one. The reader may have to scrutinize the front matter of a journal (the masthead and publication information) or a journal web page to determine the nature of the publication.

The front matter should also include the names of the external editorial board. The existence of an external editorial board means there is objective oversight of the content and quality of material published in the journal. The names of actual reviewers are rarely published, however; the peer review process is more likely a blinded one, meaning that article authors do not know the identity of the manuscript reviewer, and the reviewer does not know the identity of the authors.

If it is not clear whether the journal is peer reviewed, or if an article has been retrieved electronically and the journal's front matter is not available, some hints may indicate whether a journal is a scholarly one. Characteristically, peer-reviewed journal issues are identified by volume and number, and the pages are numbered sequentially through the entire year instead of starting over with each issue. An article published in October, therefore, would likely have page numbers in the hundreds. The first page may also specify the date on which a manuscript was received, reviewed, and subsequently published. This information would confirm that a journal article has been peer reviewed.

The first page of the article should describe the author's credentials and place of employment, along with contact information. Any potential conflicts of interest should be identified here as well. Funding sources for research studies might appear in the credentials section or at the end of the article. Ideally, the journal will also identify any potential conflicts of interest—such as companies owned by the journal's parent company—that might introduce bias into the publication's selection process.

Reading research, much like any nursing skill, becomes easier with practice. As a practicing nurse reads, studies, and engages in research projects, this process becomes more efficient and informative. The process of evaluating research, which may initially require a great deal of focus and effort, eventually becomes second nature. As the appraisal of research becomes part of the nurse's routine, the ability to select studies for application to practice allows the nurse to ensure that their practice is based on sound evidence.

Using Research in Evidence-Based Practice

Research is key for EBP. Scientific, rigorous, peer-reviewed studies are the foundation of evidence for professional nursing practice. Selecting, reviewing, and incorporating research findings into practice lie at the heart of professional nursing care delivery; however, EBP does not eliminate the need for professional clinical judgment. The application of a specific EBP guideline to a specific patient situation is based on the nurse's assessment of the situation and an appraisal of the interventions that are most likely to be successful. The clinician remains responsible for combining evidence with clinical expertise and patient values in managing individual patients and achieving optimal outcomes.

Where to Begin?

The process of applying research to EBP begins by identifying a problem that will be best addressed by a review of the evidence. The choice of a subject to study may be driven by a variety of factors. Newell-Stokes (2004) classifies three general categories that may uncover the need for EBP.

The first category includes problem-focused factors. These factors are generally clinical problems that are identified through quality-improvement processes, benchmarking studies, regulatory agency feedback, practicing clinicians, or administrative data. For example, a hospital may identify a problem with skin breakdown through nurse observation, quality data indicating an increase in pressure ulcer rates, analysis indicating pressure ulcer rates that are higher than those in comparable hospital units, or data that demonstrate higher costs for patients with skin breakdown.

The second category includes factors related to nursing knowledge. A knowledge deficit may be evident, or new knowledge may emerge through research studies. In addition, a new professional association or new national guideline presents opportunities for incorporating evidence-based changes into practice. A practice change often has a better chance of implementation if users perceive the existence of a solid base of evidence for that practice change.

CHECKLIST FOR EVALUATING THE CREDIBILITY OF A RESEARCH ARTICLE

- ❑ The authors have the appropriate clinical and educational credentials for this research study.
- ❑ There is no evidence of any conflict of interest for the authors that might introduce bias into the way the study is designed or the way the results are viewed.
- ❑ There is evidence that this journal is peer reviewed (at least one of these):
  - Issues are identified by volume and number.
  - The journal has an external editorial board.
  - The article indicates a review date.
- ❑ The publication has no financial connection to positive or negative results from the study.
- ❑ The study has been published in a reasonable time frame (i.e., a reasonable interval from the date of study to the date of publication).

The third category includes factors such as new equipment, technology, or products that become available. All of these new developments present opportunities to use evidence in practice to improve outcomes.

Once the need is identified for a change in practice, the way that the research is gathered and used may take a variety of forms.

Processes for Linking Evidence to Practice

Evidence can be incorporated into practice through several processes. For example, an individual nurse may appraise research studies and share findings with colleagues. Also, a specific question may be answered by reviewing the literature or attending research presentations at conferences.

Although reviewing research studies is a good beginning for establishing evidence for nursing practice, it is possible to introduce bias into the selection of the articles to review. Nurses may consciously or unconsciously select only those articles that support their point of view while ignoring studies that challenge their beliefs. Engaging in a systematic review process will control the potential for such bias to occur. A systematic review process is a structured approach to a comprehensive research review. It begins by establishing objective criteria for finding and selecting research articles, combined with documentation of the rationale for eliminating any study from the review.

Research studies that are selected for inclusion in the review should be subjected to careful and thorough appraisal of study quality and validity. They are graded based on the strength of evidence that they provide as well as their design and quality criteria. Several different rating scales may be used to evaluate a research study's strength as evidence, but it is important to recognize that one rating system is not necessarily better than another. Individual values, the nature of the practice question, and the kind of knowledge needed drive the choice of a rating system. Most grading systems include between four and six levels. **Table 1-3** depicts a rating system for levels of evidence that is a composite of the work of Ahrens (2005), Armola et al. (2009), and Rice (2008).

Using this scale, for example, a randomized trial of the use of aromatherapy in a postanesthesia care unit to reduce nausea would be classified as the strongest level of evidence if the findings came from a large study with definitive results or if the results were successfully replicated several times at several sites. The same study conducted in a single setting with a small sample of convenience would provide evidence that was less authoritative. Weaker still would be evidence that was generated through observation or expert opinions.

These strength-of-evidence rating scales apply primarily to the evaluation of treatments, interventions, or the effectiveness of therapies. Recall the definition of EBP: practice based on the best demonstrated evidence combined with clinical experience and patient preferences. The hierarchy of evidence may look quite different depending on the nature of the practice under study.

Review and rating of the evidence should result in recommendations for practice, with an identifiable relationship between the strength of the recommendation and the strength of the evidence. The quality of the study and situation-specific variables should also be considered. This is the way in which varying levels of evidence may be incorporated into a single practice guideline. **Table 1.4** depicts these relationships.

Table 1-3 Rating Systems for Grading Levels of Evidence

Level of Rating	Type of Study
Level I	Multiple randomized controlled trials (RCTs) reported as meta-analysis, systematic review, or meta-synthesis, with results that consistently support a specific intervention or treatment Randomized trials with large sample sizes and large effect sizes
Level II	Evidence from well-designed controlled studies, either randomized or non-randomized, with results that consistently support a specific intervention or treatment
Level III	Evidence from studies of intact groups Ex post facto and causal-comparative studies Case-control or cohort studies Evidence obtained from time series with and without an intervention Single experimental or quasi-experimental studies with dramatic effect sizes
Level IV	Evidence from integrative reviews Systematic reviews of qualitative or descriptive studies Theory-based evidence and expert opinion Peer-reviewed professional organization standards with supporting clinical studies

Table 1-4 The Relationship Between Evidence and Practice Recommendations

Rating of Evidence	Evidence of Harm	Evidence of Benefit
Level I	Strong recommendation against implementation	Strong recommendation for implementation
Level II	Recommend no implementation	Recommended to implement
Level III	Recommend no implementation	Action is optional, situation-dependent
Level IV	Action is optional, situation-dependent	Action is optional, situation-dependent

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Based on the strength of the evidence and whether the study showed benefit or harm, recommendations may be classified from strongly recommended to optional actions that are situation dependent. Some evidence results in such benefit that it should be strongly recommended in a guideline. Other evidence may show harm, and these actions should be avoided. Evidence that is inconclusive can be optional and situation dependent.

The systematic review process is complex and time-consuming and should be undertaken only when no other EBP guidelines exist. The effort is warranted, though,

when no clear guidance exists for specific practices, or when the development of a guideline is likely to be affected by practitioner bias.

Creating Evidence for Practice

Nurses commonly serve as the primary investigators in studies that focus on the needs of patients and the effectiveness of nursing interventions. When a nurse conceives of, designs, and implements a research project, they are designated as a primary investigator. The primary investigator is responsible for all aspects of a research study's conduct and outcome, even if a team is involved. The primary investigator also has the right to be the first author noted on a research publication.

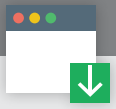
Designing a research study is an advanced and complex skill that requires experience in the clinical processes under study as well as an understanding of the complexity of research design and analysis. That is not to say that the professional nurse cannot gain the skill and experience needed to be a primary investigator—only that becoming a nurse researcher is an evolutionary process that occurs over time. It is the rare nurse who is able to design and conduct a brilliant study on the first attempt. More commonly, a nurse learns the process by becoming involved in the research of others in some way—either in data collection, through team participation, or even as a subject. Only gradually does the nurse gain the ability to conceive of and lead a research project.

Creating nursing research is a systematic, rigorous process. The remainder of this text will guide the nurse as they gain the foundation needed to read, use, and create evidence.

Summary of Key Concepts

- The practice of nursing is founded on nursing knowledge, and nursing knowledge is generated and disseminated through reading, using, and creating nursing research.
- Nursing research is a systematic process of inquiry that uses rigorous, systematic approaches to produce answers to questions and solutions to problems in nursing practice.
- Research is designed so that it is free of bias and results are trustworthy. The hallmarks of solid, well-respected research are peer review and replication.
- Nurses may use research to synthesize the findings of others, explore and describe phenomena, find solutions to problems, or test traditional approaches for efficacy.
- Research is fundamental to nursing practice because conduct of research is characteristic of a profession and nurses are accountable for the care they deliver.
- Consumers and external agencies are demanding that healthcare professionals provide evidence for the effectiveness of the interventions they propose and implement.
- Nursing is a relatively young profession, but its practitioners have a proud history of disciplined inquiry. The NINR gives nursing research national stature and financial support and also establishes a national agenda of priorities for nursing research.

- Nurses may fulfill a variety of roles in contemporary nursing research practice, ranging from informed consumers to data collectors to primary investigators. As they become more proficient in nursing research, their roles may broaden and involve projects of increasing complexity.
- Research is not synonymous with problem solving; it is intended to benefit the profession as a whole. A systematic approach and upfront, informed consent of subjects are hallmarks of the research process.
- The benefit of research to nurses lies in its use as evidence for practice. EBP entails the use of the best scientific evidence integrated with clinical experience and incorporating patient values and preferences in the practice of professional nursing care. Numerous types of research are required to accomplish this goal.
- EBP is important in nursing because outcomes are improved, care is more efficient and effective, and errors are reduced when practitioners use evidence as a standard of care.
- Evidence can be used as a basis for nursing practice in assessing the patient's condition, diagnosing patient problems, planning patient care, evaluating interventions, and evaluating patient responses.
- Barriers to using evidence as a basis for nursing practice may be related to the nature of evidence in practice, individual issues, or organizational constraints. Nurses must identify barriers to the use of evidence in practice and implement strategies to overcome them.
- Future directions in nursing research include focusing on research as an integral part of nursing practice in a collaborative environment.



CRITICAL **APPRAISAL EXERCISE**

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

Ortiz, J., McGilligan, K., & Kelly, P. (2004). Duration of breast milk expression among working mothers enrolled in an employer-sponsored lactation program. *Pediatric Nursing, 30*(2), 111–118.

Review the article, including information about the authors and sponsors of the study. Consider the following appraisal questions in your critical review of this research article:

1. Do the authors have the appropriate clinical and educational credentials for this research study? What are the strengths and weaknesses of this research team?
2. Is there evidence of any conflict of interest that might introduce bias into the way the study is designed or the way the results are viewed? Do the authors have any potential to realize a financial gain from the results of this study?
3. What is the evidence that this journal is peer reviewed? Find the website of this journal. Does the journal have an editorial board?

4. Does the journal have anything to gain by publishing positive or negative results from this study?
5. Is there evidence of bias in the way the study was designed or implemented? If so, how does it affect the nurses' use of these data in the practice setting?
6. Appraise the level of evidence this research study provides the nurse and the strength of the recommendation for practice provided by the results.

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