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EVIDENCE-BASED PRACTICE IN NURSING
Second Edition
Implementing EBP in a Nutshell
Maryann Godshall
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FAST FACTS FOR EVIDENCE-BASED PRACTICE IN NURSING
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FAST FACTS FOR EVIDENCE-BASED PRACTICE IN NURSING
Implementing EBP in a Nutshell
Second Edition

Maryann Godshall, PhD, RN, CPN, CCRN, CNE
I would like to dedicate this book to the bedside nurse—whether a new graduate or a long-time, dedicated professional, who seeks to achieve excellence in nursing practice or to further educational goals by completing an advanced nursing degree. This is for you.
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Preface

As a practicing nurse, I realize every day the importance of using the best evidence to deliver excellent-quality care to my patients. As an educator, I assist nurses in achieving their goal of obtaining their BSN. While teaching a course titled Evidence-Based Nursing Practice, I discovered that many of my students had never taken a basic research course. Indeed, they were fearful of research. I also had difficulty finding a suitable textbook that was written at the appropriate level and clearly explained the sometimes complex topics involved in research.

As a result, I decided to write my own book—one that nurses could use to understand basic research concepts, to assist them in obtaining “evidence” about their current daily practice, and to help them develop evidence-based practice (EBP) projects.

This book aims to assist both the experienced bedside nurse and the recent graduate in understanding EBP and in embracing its implementation as a means of improving the quality of patient care. For the bedside nurse who may have significant clinical experience but may not have had the opportunity to take a research course, this book will serve as a guide to understanding the language and process of research. Alternatively, for the new nurse graduate, who may have taken a research course but may not have significant clinical experience, this book will serve as a useful reference in the workplace.
The book reviews the process of EBP, which involves defining a clinical situation of interest, formatting a good clinical question, conducting a literature search (i.e., finding the evidence), reading and critiquing research findings or published research reports (or both), and deciding if the “evidence” warrants a change in practice. This book also reviews basic research terms and principles.

The newly qualified nurse researcher may find this book useful in implementing new research to create evidence when none is yet available. It is my hope that this book will empower the reader to become comfortable with research reports and the research process and to embrace and use research to suggest enhancements to the quality of patient care in the clinical environment.

This book is organized to assist bedside nurses in understanding and developing EBP projects that relate to their patient populations. It delivers a wide scope of EBP content in the abbreviated style of the Fast Facts book series, developed by Springer Publishing. Short chapters offer key content using helpful headings and tables. “Fast Facts in a Nutshell” highlight important concepts and points in every chapter. Basic quantitative and qualitative research approaches are presented, as is an overview of EBP. This includes identifying the “compelling question,” finding and critiquing the evidence, and exploring the importance of disseminating what you have found to your colleagues and professionals throughout the world. This book also attempts to demystify systemic reviews and to explain how to conduct database searches. The book has been classroom tested and used in both live and online course formats.

Maryann Godshall
I would like to acknowledge the RN students in my EBP course, who were the reason this book was developed. The goal was to develop an EBP book to meet the needs of the typical bedside nurse. I would like to thank Margaret Zuccarini, who listened to my idea and encouraged me to write this book. I would also like to thank Kris Parrish and Joe Morita for their assistance in preparing this second edition and making it the best it can be. Without all of these people, this dream would not have become a reality. Thank you all.
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Fast Facts for Evidence-Based Practice in Nursing: Implementing EBP in a Nutshell, Second Edition
Introduction to Evidence-Based Practice

Every day, nurses are on the front line of patient care. It is the nurse who first notices a change in patient status. It is the nurse who implements and then evaluates the effectiveness of interventions. Often, nurses wonder who determines how nursing is practiced or why procedures are performed a certain way. A nurse might think, “It would be so much better if we did this procedure a different way.” Did you ever wonder how you might change or influence the way patient care is delivered? New evidence comes into play every single day at the bedside as technology changes, research evolves, and patients present with new and unique disease processes. Nurses who rely simply on the knowledge learned during their basic education quickly become outmoded. We have all evolved from simple patient care practitioners to nurse scientists. To be a proficient and informed nurse scientist you need to remain current with the latest research and treatment modalities. Simply doing things “because we have always done them that way” is an outdated thought process. Today, we must base our nursing and patient care on the latest evidence-based nursing research. If you have ever asked yourself such questions or wondered about practice issues, evidence-based practice (EBP) can be your roadmap to
saying changes in the way patient care is delivered. It is the nurse who provides direct care to the patient. Why shouldn't the nurse identify patient care problems and procedural issues, thereby recommending for consideration changes in how patient care is delivered? Now is the time for you to learn how you might use EBP strategies in your patient care area, unit, or institution.

In this chapter, you will learn:

1. The history of EBP
2. The definition of EBP
3. How to use EBP
4. An example of EBP
5. The requirements for EBP
6. Models of EBP
7. Controversies surrounding EBP
8. A rating system for the hierarchy of evidence in EBP
9. The limitations of EBP
10. EBP and Magnet™ hospital designation

BRIEF HISTORY OF EVIDENCE-BASED PRACTICE

A cornerstone of the evidence-based movement was laid by Dr. Archie Cochrane, a British epidemiologist. Cochrane struggled with the efficacy of health care and challenged patients to pay only for care that was judged effective through proven methods. In 1972, Cochrane published a landmark book, *Effectiveness and Efficiency: Random Reflections on Health Services*, that criticized the medical profession for not conducting rigorous reviews of research evidence, so that organizations and policymakers could reach valid decisions about health care. Cochrane strongly advocated determining preferred treatment and practice by using evidence from randomized clinical trials (RCTs). His support of the development of a system to systematically organize this information led to the creation of the Cochrane library (www.cochranelibrary.com/).
In 1993, the Cochrane Collaboration was established to support international efforts to improve health care throughout the world. More than 11,000 people have contributed to the collaboration. Cochrane reviews bring together research on the effects of health care and are considered the gold standard for determining the effectiveness of different interventions (Cochrane Collaboration, 2015a).

**Research Utilization and Nursing**

During the 1980s, the field of nursing supported efforts to apply research findings to practice. This process, called research utilization, uses some aspect of a study in a manner unrelated to the intent of the original research. It may result in changing practice based only on the findings of a single research study (Barnsteiner & Prevost, 2002). Research utilization also focused on translating the extant research to practice instead of systematically determining the worthiness of findings of the research prior to implementing it into practice (Beyea & Slattery, 2013). As research is conducted over time, evidence accumulates about a particular topic (Polit & Beck, 2012) that can be used to varying degrees in clinical practice. For example, after reading a qualitative research article about the implications of hope for inpatients with long-term chronic illnesses, a nurse may be more aware of the importance of maintaining hope when working with these patients. As a result, the nurse may become more aware of how his or her actions may affect patients’ feelings of hopefulness. Through research utilization, the nurse may then change his or her actions based on the reading of this one research article. This may not have been the original intent of the research project. Note that this example illustrates an instance in which the nurse demonstrates a greater awareness of the care he or she delivers. A nurse would not change the actual physical care of a patient without a change in an approved protocol, but a physician might.

The difference between research utilization and EBP is that research utilization may lead to changes in practice
that are based on the results of one study, whereas EBP answers a clinical question based on an in-depth literature search conducted to find all relevant current research evidence related to that problem. So, although research utilization was an important concept to nursing, the EBP movement has led to important changes in clinical actions and practice as a result of collaboration among the disciplines. Today, most baccalaureate nursing programs have a required research course, which was not the case years ago.

Health care insurers and regulators have placed an emphasis on providing evidence-based care, especially where a cost savings can be found. The goal of improving care, decreasing costs, and promoting high-quality care should lead to shorter hospital stays and save insurance dollars. Health care institutions have focused on encouraging health care workers to develop methods for implementing evidence-based interventions, such as utilizing proper handwashing procedures to reduce the risk of transmission of microbes to patients (Beyea & Slattery, 2013).

**Evolution from Research Utilization to Evidence-Based Practice**

Because EBP is broader than research utilization, nursing professionals began to actively explore the advantages of reviewing and analyzing all of the available evidence on a given topic or problem before taking steps to recommend a change in practice. Thus, EBP represented a major paradigm shift for health care education and nursing practice. As the profession of nursing has evolved, nurses have become better educated and more involved in critiquing research studies. The purpose of critiquing is to analyze a study for flaws, evidence of bias, or other variables that might have affected the results. Polit and Beck (2012) note that a skillful clinician can no longer rely only on experience or a repository of memorized information, but must now be adept in accessing, evaluating, synthesizing, and applying new research evidence.
When evaluating research studies, make sure the research study design is congruent with its purpose. Quite simply, does the research study examine what it says it is going to?

Translating Research Into Practice

Translating research evidence into actual nursing practice is a challenging process. Some resources are available to help implement EBP, including integrative reviews, systematic reviews, meta-analyses, and clinical practice guidelines.

- **Integrative reviews** are scholarly papers that offer generalizations about substantive issues based on a set of relevant studies. They synthesize published studies and articles to find answers to questions of interest. They are frequently found in peer-reviewed professional publications (Mileham, 2009).

- **A systematic review** is a state-of-the-art summary of all the research information available at a given time on a particular subject. This is not a literature review, but a review of actual research studies. All items in a systematic review address a specific clinical question. A systematic review attempts to cover all the evidence available. Systematic reviews can be found online at the Joanna Briggs Institute (www.joannabriggs.org) and the Cochrane Collaboration Center (http://community.cochrane.org/handbook). The Cochrane Collaboration primarily addresses questions on the effectiveness of interventions or therapies and has a focus on synthesizing evidence from RCTs (Cochrane Collaboration, 2015b). The Briggs Institute includes other study designs and evidence derived from different sources in its systematic reviews (Aromataris & Pearson, 2014). It is important to consider the source of a systematic review, particularly the credentials of the individual conducting the review and the integrity of the sources searched.
• A **meta-analysis** is a combination of the results of studies into a measurable format that statistically estimates the effects of proposed interventions and then critically reviews them to minimize bias. It is different from an integrative review in that it includes works that are similar or identical, so that a statistical comparison can be made (Schmidt & Brown, 2009).

• **Clinical practice guidelines** (CPGs) are available to help guide clinical practice. As with systematic reviews, they distill a large amount of evidence into a manageable and usable format. CPGs are practice recommendations based on the latest and best medical evidence available. They can be used to guide clinical practice and clinical decision making that affects the diagnosis, treatment, prevention, or management of a particular medical issue or condition. This involves balancing the benefits and risks of an EBP decision. CPGs usually are based on systematic reviews and give specific practice recommendations and prescriptions for evidence-based decision making (Polit & Beck, 2012). CPGs are developed to help guide clinical practice even when only limited evidence is available. As multiple guidelines are being developed for the same topic, the same rigor must be used to critically appraise them as would be used in appraising a research article.

**FAST FACTS in a NUTSHELL**

Sources for CPGs include the National Guideline Clearinghouse (www.guideline.gov), the Registered Nurses Association of Ontario (www.rnao.org/bestpractices), the Canadian Medical Association (www.cma.ca/En/Pages/clinical-practice-guidelines.aspx), and Translating Research into Practice (www.tripdatabase.com/index.html). There are also guides specific to such specialties as, for example, women’s health and neonatal nursing.

EBP is based on a comprehensive review of research findings that emphasizes intervention, RCTs (the gold standard), integration of statistical findings, and critical decision
making about the findings based on the strength of the evidence, tools used in the studies, and cost (Jennings, 2000; Jennings and Loan, 2001). Basic steps involved in implementing EBP are listed in Table 1.1.

**TABLE 1.1 Seven Steps of Evidence-Based Practice**

1. Ask or identify the important clinical question.
2. Collect the best and most pertinent evidence.
3. Critically analyze and rate the evidence.
4. Integrate the evidence with your own clinical expertise, patient knowledge, and patient values in making a practice decision or recommending a change.
5. Implement your practice change, if authorized.
6. Evaluate how the practice change has influenced or affected your practice area.
7. Disseminate and share this evidence with your peers and colleagues.

**Models of Evidence-Based Practice**

Several comprehensive models for implementing EBP have been developed. They include:

- ACE Start Model of Knowledge Transformation (Stevens, 2012)
- Clinical Nurse Scholar Model (Schultz, 2005)

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**Question:** Do you have to be a nurse researcher to understand and utilize EBP?

**Answer:** No. EBP can be used by the bedside nurse to understand best clinical practices and to devise EBP projects of his or her own that may lead to recommendations for changes in clinical practices.
• Diffusion of Innovations Theory (Rogers, 2003)
• Iowa Model of Evidence-Based Practice to Promote Quality Health Care (Titler et al., 2001)
• Johns Hopkins Nursing Evidence-Based Practice Model (Newhouse et al., 2005)
• Model for Change to Evidence-Based Practice (Rosswurm & Larabee, 1999)
• Promoting Action on Research Implementation in Health Services (PARIHS) Model (Kitson et al., 2008)
• Stetler Model of Research Utilization (Stetler, 2001)

Steps and procedures in many of these models are similar; what differs is how these perspectives translate research into practice (Polit & Beck, 2014). Methods for implementing EBP and for asking the important clinical question are summarized below and explored in detail in later chapters of this book.

DEFINITION OF EVIDENCE-BASED PRACTICE

The definition of EBP varies in relation to the concepts included. A search of the literature reveals that most definitions include (a) a focus on either the patient or the practitioner or (b) three components: research-based information, clinical expertise or practice, and patient care. Melnyk and Fineout-Overholt (2010) define EBP as an “approach that enables clinicians to provide the highest quality of care in meeting the multifaceted needs of patients and families” (p. 3). An article by Melnyk (2003) states that EBP is “a problem solving approach to clinical decision making that incorporates a search for the best and latest evidence, clinical expertise and assessment, and patient preference and values within a context of caring” (p. 149).

Sigma Theta Tau International (2005), in a position paper, defines evidence-based nursing as “an integration of the best evidence available, nursing expertise, and the values and preferences of the individuals, families and communities who are served.” This takes into account not only the
research-based evidence, but also the situations nurses face when implementing best practices with people of various cultures, needs, and health care preferences. Sigma Theta Tau considers evidence-based nursing as a foundation for nursing practice.

Rutledge and Grant (2002) define EBP as “care that integrates best scientific evidence with clinical expertise, knowledge of pathophysiology, knowledge of psychosocial issues, and decision making preferences of patients” (p. 1). This definition expands EBP to include consideration of pathophysiology and psychosocial issues in the decision-making process. Magee (2005) directs the definition toward physician care versus nursing care and states that EBP is “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of the individual patients” (p. 73). Pravikoff, Tanner, and Pierce (2005) offer a simplified definition of EBP as “a systematic approach to problem solving for healthcare providers, including RNs, characterized by the use of the best evidence currently available for clinical decision-making in order to provide the most consistent and best possible care to patients” (p. 40). Ingersoll (2000) includes both the patient and the practitioner in her definition, stating that EBP is “the conscientious, explicit, and judicious use of theory driven research-based information in making decisions about care delivery to individuals or groups of patients and considers individual needs and preferences” (p. 152).

After considering these definitions, how can we define EBP for nursing? Quite simply, EBP is using the best available evidence to guide clinical practice so that patients receive the best possible nursing care. It is important to differentiate among the terms evidence-based practice, evidence-based medicine, and evidence-based nursing, as they should not be used interchangeably. Evidence-based medicine is how physicians practice medicine. Evidence-based practice refers to physicians’ or nurses’ use of evidence to guide practice. Finally, evidence-based nursing emphasizes nursing interventions that are based on the best evidence.
HOW DO I PARTICIPATE IN AN EVIDENCE-BASED PRACTICE?

Think of a clinical situation that generated questions in your mind for which you had no answers. There are several ways that you might try to find an answer to your question(s), including:

- Asking an authority or expert in the field
- Consulting a textbook
- Looking for an article in a nursing journal
- Looking for an article in a scholarly journal
- Asking a nursing peer
- Using simple trial and error
- Using your intuition, judgment, or reasoning skills to solve the problem yourself

As you can see, these responses are varied. In nursing, especially if time is critical, nurses may be required to make the best judgment at a particular moment. But, is this best practice? In making such a decision, does the nurse act in a routine manner in following accepted practice, or as an individual who takes the steps to find answers to questions, thereby promoting the knowledge base of nursing? By using research evidence to guide practice, nurses can provide patients with the best interventions possible based on current research.

EBP uses current research findings as the basis for practice rather than using “acceptable standards” of practice. In essence, the latter meant doing things because “that is how we have always done them.” Nurses may make specific decisions in caring for patients because they have been taught that the expert nurses’ experience “works the best.” Those expert experiences are important and valued, but in the context of EBP they now are considered evidence that needs to be substantiated or validated through research and research dissemination in professional, scholarly, academic, and peer-reviewed publications. As the amount of evidence increases, so will EBP increase across professional nursing.
AN EXAMPLE OF EBP IN ACTION: SALINE VERSUS HEPARIN FLUSHES

Numerous studies have examined whether intermittent intravenous infusion reservoirs (heparin locks or wells) remain as patent with flushes of normal saline solution as with use of a heparin lock solution. Research evidence has demonstrated that saline flushes are as effective as heparin flushes for maintaining peripheral intermittent infusion devices using catheters larger than 24 gauge. This topic has been studied frequently in children (Wong, 2002). Lombardi, Gunderson, Zammett, Walters, and Morris (1988) conducted a sequential, nonrandom design of 74 catheter sites and found no difference in patency of catheters sized 20 to 24 gauge. In fact, there was a tendency for phlebitis to develop more often (13 versus 7 sites in the normal saline group) when using heparin flush solutions. Danek and Norris (2002) examined 160 infusion devices and found no difference in patency of 22-gauge catheters. These findings were also supported by McMullen, Fioravanti, Pollack, Rideout, and Sciera (1993), Hanrahan, Kleiber, and Fagen (1994), and Robertson (1994). Beecroft, Bossert, and Chung (1997) carried out a collaborative study involving nine hospitals and 451 subjects and found that heparin-maintained (10 units/mL and 100 units/mL) catheters sized 22 and 24 gauge remained patent longer than did catheters that used saline alone as a flush. A randomized controlled trial by Mok, Kwon, and Chan (2007), two of whom are clinical nurses and one a nursing professor, found no significant differences in the longevity of catheter patency or incidence of intravenous complications of 123 intravenous locks maintained with saline flush or heparin flush (1 unit/mL or 10 units/mL).

Now, if you ask who first questioned the practice of using heparin flushes or whether saline flushes might be as effective as heparin flushes, you will learn that it was a nurse. This is just one example of how a nurse’s observations and subsequent questioning changed nursing practice. Your observations or ideas, too, can change practice by initiating the question, conducting a literature review based on that
question, examining the evidence and, if no evidence exists, suggesting that research studies might be needed to create the evidence to substantiate your hunch or idea.

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As a nurse embarking on EBP, it is important for you to first understand the basic concepts of research and how to rate or evaluate the evidence before suggesting that it be used to guide practice. Understanding nursing research will enable you to better apply research findings in your everyday practice.

**REQUIREMENTS FOR AN EVIDENCE-BASED PRACTICE STUDY**

The move toward EBP means, by definition, that anyone can conduct an exhaustive search of the literature and analyze the findings to determine the best evidence. A hospital librarian or nursing colleague can assist you in getting started to find research articles. A novice, who does not have the background or perhaps does not understand basic research methods, should ask a more experienced mentor for assistance in evaluating such research. Always remember that an EBP project requires an exhaustive, systematic, and analytical review of the literature. Although a single study should never result in a change in practice, the results of one study might provide the impetus to look at a current clinical process, construct a clinical question, and conduct further research that might support or invalidate the findings of that one study.

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One research study should never change nursing clinical practice. A researcher must collect and analyze a complete review of the literature and then determine if this evidence has merit and should actually change practice.
The seasoned nurse must use sound reasoning and clinical judgment. Benner, Tanner, and Chesla (2009) describe clinical judgment as the way in which nurses come to understand and respond in concerned and involved ways based on salient information in a situation. Clinical judgment should encourage use of all types of available knowledge on which decisions can be based. The nurse’s knowledge of patients or clients as people takes into consideration both cultural and ethical values in every step of the nursing process (Benner et al., 2009). For example, although research might show that a particular intervention is effective in reducing complications of stroke, this same intervention might not be acceptable in populations whose religious or cultural beliefs oppose this type of intervention.

CONTROVERSIES SURROUNDING EVIDENCE-BASED PRACTICE

Evidence-Based Practice as a “Cookbook” Approach to Care

One controversy about EBP is that it offers a so-called cookbook approach to care and may override the individualization of care. Clinical decisions should be based on the evidence, as well as on a response to specific clinical situations or patients (Melnyk & Fineout-Overholt, 2005). It could also be argued that EBP might discourage attention to cultural issues, but nursing care must consider cultural variations in every given situation.

No Evidence

Another important controversy surrounding EBP is that no evidence may exist pertaining to a particular clinical question or that the purported evidence or research published on the clinical topic of interest may be weak, poorly structured, or flawed. Another concern is that existing evidence may be too limited to serve as the basis for changing practice. For
some topics of interest, there may be just one published research study. While you may be excited to find research on your topic of interest, it is important to critically evaluate the research that you have found. How do you conduct a critical evaluation to determine if it is good research? There are protocols to follow when evaluating research. If the research is not considered “good”—that is, reliable—then there is a need for a research study to be conducted on your clinical question, so that good evidence can be generated and published.

Randomized Clinical Trials

Some experts argue that because an RCT is the gold standard for evaluating EBP results, other research methods should essentially be ignored. Using this reasoning, qualitative research studies that yield valid and important evidence in exploring the problem under consideration might be disregarded in place of an RCT. However, integration of evidence relevant to nursing practice is a key component of EBP. Nurses must pay attention to all types and levels of evidence and not simply look for or use only RCTs, even though they are considered the highest level of evidence. In addition, the prudent nurse researcher should consider evidence from all disciplines, as well as all types of research methodology, to gain a thorough understanding of the available literature on the clinical question. The hierarchy and rating system for evaluating research evidence is provided in Table 1.2.

Finally it might be argued that EBP does not consider nursing theory as well as humanistic aspects of care. For those interested in nursing theory, very few research studies are based on or use nursing theory. This is another issue and concern voiced by the nursing profession.

Evidence-Based Practice
and Magnet Hospital Designation

Twenty-five years ago, the American Nurses Credentialing Center (ANCC) developed the Magnet Recognition Program®
as a way of highlighting health care organizations that achieve a hallmark of excellence for nursing practice and professional development. To attain Magnet status, hospitals must demonstrate quality nursing care through EBP. This includes patient care delivery that is guided by the integration of best evidence, clinical care decisions based on critical thinking, and improved patient outcomes. Evidence-based practice committees have emerged as a way to provide a systematic approach for enabling new evidence to reach the bedside nurse. For ANCC Magnet reapplication, the focus is placed more strongly on clinical outcomes. The Magnet program encourages nurses to guide their clinical practice and make recommendations. An EBP committee becomes the best mechanism for integrating best evidence into clinical practice settings and keeps nurses actively involved in improving patient outcomes (Wise, 2009).

**LIMITATIONS OF EVIDENCE-BASED PRACTICE**

Limitations of EBP include a shortage of good, coherent, and consistent scientific evidence in support of nursing practice.

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**TABLE 1.2. Rating System for Hierarchy of Evidence**

| Level 1: Evidence from a systematic review or meta-analysis of all relevant RCTs or established EBP clinical guidelines |
| Level 2: Evidence obtained from at least one well-designed RCT |
| Level 3: Evidence obtained from a well-designed controlled trial without randomization or a systematic review of correlational/observational studies |
| Level 4: Evidence from well-designed case-control and cohort studies that are correlational or observational |
| Level 5: Evidence from systematic reviews of descriptive, qualitative, or physiological studies |
| Level 6: Evidence from a single descriptive, qualitative, or physiological study |
| Level 7: Evidence from the opinion of authorities/experts or case reports of expert committees, or both |

Adapted from Polit and Beck (2014); Melnyk and Fineout-Overholt (2010).
There is also difficulty in applying the evidence obtained to individual patients in particular clinical situations (Fain, 2009). Some nurses are hesitant or might even refuse to consider using EBP in their nursing practice and care. It is important to understand why this occurs. The reasons nurses give for not using research findings in their clinical practices are listed in Table 1.3.

**FAST FACTS in a NUTSHELL**

Pravikoff, Tanner, and Pierce (2005), in a report entitled “Readiness of U.S. Nurses for Evidence-Based Practice,” summarized their findings from a random sample of 3,000 nurses in the United States. They concluded that while registered nurses (RNs) generally acknowledge the need for information in order to assure effective practice, they simply were not prepared to use the information resources available to them.

| TABLE 1.3 Reasons Why Nurses Do Not Use Research Findings in Their Practices |
| 1. Nurses may not know or be aware of research findings. |
| 2. Nurses in practice do not usually associate or communicate with those who produce research findings. |
| 3. Nurses lack the ability to locate and find relevant research reports. |
| 4. Research is often in language that is not clinically meaningful. |
| 5. Nurses do not understand research methods and have never had formal research classes in their nursing schools. |
| 6. Nurses lack the value for research in practice. |
| 7. Computer databases are not readily accessible to the nurse. |
| 8. Nurses lack the basic knowledge to use information technology. |
| 9. Nurses have no time to obtain this information. |
| 10. Nurses do not understand exactly what EBP is. |
| 11. People have a fear of the unknown and a fear of change. By understanding these processes, fear can be alleviated. |

Adapted from Fain (2009); Pravikoff, Tanner, and Pierce (2005)
The reasons why RNs were generally unprepared for EBP include:

- Limited time availability
- Little or no education or training in information retrieval or accessing computer databases
- Lack of needed basic computer skills
- Limited access to high-quality information resources or databases
- Attitudes that did not value or understand research

Pravikoff and colleagues (2005) felt this could be attributed to the rapid technological changes over the past 10 to 15 years, along with the failure of nursing education programs to prepare students at all levels to understand and value research-based practice versus a practice based on tradition, intuition, and nursing experience.

So, now is the time for you to learn about basic research principles and to increase your understanding of what EBP is all about. This book will guide you in unlocking the mysteries of EBP and help you understand how evidence can be used in your clinical area to change or improve practice. Let’s get started in determining how EBP can be used by working through some examples of how an evidence-based project might begin.

Once you have explored the beginnings of an EBP project in the next few chapters, you will learn why it is important to pay careful attention to overcoming the barriers to implementing EBP. Methods and suggestions to do so will be discussed in detail in Chapter 8.
2

Asking the Compelling Question

When beginning an evidence-based practice (EBP) project, several steps are crucial to consider, including developing a well-constructed clinical question. Taking time to construct a clinical question is of chief importance because this question will drive every aspect of your research, from the initial literature search to the final success of your project. This chapter explains how to begin selecting your clinical question and provides tools to construct a high-quality clinical question.

In this chapter, you will learn:

1. How to start an EBP project
2. How to structure a compelling clinical question
3. How to use the PICO/T method in implementing EBP
4. How to determine if a study is valid and reliable
2. ASKING THE COMPELLING QUESTION

HOW TO START AN EVIDENCE-BASED PRACTICE PROJECT

Sackett, Richardson, Rosenberg, and Hayes (2000) described this step as the most challenging in the EBP process. Where do you find an appropriate question? Your clinical or work environment presents many opportunities for developing a compelling question, such as those listed below.

- Has there been a time in clinical practice when you wondered, “Why do we do it this way” and, after asking a colleague, received the answer, “because that is the way we have always done it” or “because that is the only way it works?” The next time you hear these words, take a step back and ask yourself, “Does this make sense?”
- Why do nurses always use a black pen to chart their notes? Is it simply preference or the result of trial and error? The reason is simple. When photocopying and scanning notes into the computer database, black ink shows up better than blue. This illustrates a trial-and-error method of problem solving, but it also provides a relevant example of a possible source of a compelling clinical question.
- Have you wondered why bed alarms are used for particular patients? The answer is that a research study showed that bed alarms decreased the number of patient falls on a given unit. A screening tool identified patients considered to be “at risk.” For these patients, a bed alarm was activated, and the fall risk for those patients was reduced. This sounds quite basic, but several research studies have shown the effectiveness of bed alarms in decreasing patient falls. This nursing practice is a good example of EBP.

Other areas to consider when searching for a compelling clinical question include etiology, diagnoses, therapies, prevention strategies, and prognoses. Questions you might consider are those that provide meaning or insight into a phenomenon that might help nurses to appreciate or relate to a patient’s experience or to understand the growing impact of culture on the administration of health care today. With the skyrocketing cost of health care, the question could also
include a cost-containment measure or an intervention that could decrease the length of a patient’s stay in the hospital. All of these are areas for an inquisitive mind to explore.

Current research studies usually conclude with a summary discussion and a section describing the implications for further research. These are both potential sources of ideas for clinical questions. Thus, if you have the experience and qualifications, your initial EBP project may enable you to design and conduct your own research study. It is perfectly acceptable to build on existing research and answer a question posed by another author. This can be a research problem that is an area of concern or that illustrates a gap in current knowledge or in the literature. This research problem can also be the impetus to helping to form your EBP clinical question.

In developing an EBP project, one could also consider questions that might build on current nursing theory. Investigate national initiatives by U.S. government agencies, some of which routinely identify health problems and sometimes suggest research priorities. Topical areas suggested by authors for further investigation do not necessarily have to develop into full research studies, but they can inspire an EBP project. This is particularly true if it proves to be an area that might save a health care agency money or improve a process. Some excellent places to start might be the research agendas for health concerns (Adams, 2009), examples of which are available on the following government websites:

- U.S. Surgeon General’s Office (www.surgeongeneral.gov)
- National Institutes of Health (www.nih.gov)
- National Institute of Nursing Research (www.ninr.nih.gov)
- National Institute of Mental Health (www.nimh.nih.gov)

Who knows? Your EBP project could develop into a research study.

The clinical question you develop will most likely fall into one of the following categories:

- Diagnosis identification or recognition
- Therapy or intervention
• Etiology
• Impact of the prognosis
• Prevention strategy

**HOW TO STRUCTURE THE COMPELLING QUESTION IN A SEARCHABLE AND ANSWERABLE FORMAT**

When asking a compelling question, be sure the question is phrased so that it can be answered. If it is worded too broadly, you may not be able to find a usable answer. Simply restating the question may sometimes solve this problem. For example, perhaps you wanted to ask, “Why are patients angry?” Although this is a good question, it really is too broad to answer meaningfully or specifically. A better question would be, “Are anger levels lower in patients admitted to the emergency department as compared with patients admitted directly to the medical surgical floor?” Now you have narrowed your focus to a comparison between anger levels in patients being admitted to two different units. This is much more specific. The environment in which they are placed may or may not play a part in their anger. The more specific your question is, the more answerable it becomes.

Another consideration is the amount of evidence available to answer your question. If a lot of evidence exists, your question may already have been asked multiple times and does not need to be asked again. If this might be the situation in relation to your question, move on to another question. On the other hand, if no evidence is available to support your question, you may have identified an important question that should be explored. Where will you begin to find the evidence to support a question that has never been asked? First, you might look to the field of medicine for relevant studies and then to related disciplines.

For example, you might decide to investigate the stress a family member experiences when walking into the intensive care unit for the first time. If you can find no nursing studies
on this topic, you should look at resources in psychology that explore stress and coping theory. While these studies may not have been conducted in the intensive care environment, they relate by focusing on the human reaction to stress.

THE PICO/T FORMAT

Many methods are available for implementing EBP projects. One simple method used in this book is the PICO/T format, presented by Melnyk and Fineout-Overholt (2010).

The PICO/T acronym is broken down as follows:

- **P** = Patient population of interest
- **I** = Intervention of interest
- **C** = Comparison of interest
- **O** = Outcome of interest
- **T** = Time it takes to demonstrate an outcome

Initially only four components were included. Later, Melnyk & Fineout-Overholt added a fifth, representing time (i.e., the time it takes for the intervention to achieve an outcome, or how long participants are observed):

Step One: Defining the Patient Population of Interest

The first step in formulating a research or EBP question is to decide what population you want to examine. Are you interested in infants, children, adults, or geriatric individuals? Perhaps you are interested in people with psychological disorders or people with whom you deal in the community. In defining the population, describe the group clearly. If you are interested in studying the geriatric group, what ages will you include in your group: people older than...
50, 55, 60, or 65 years? Will your group include male or female patients, or both? If you are interested in working with children, what ages will you include in your group: infants, toddlers, preschoolers, school-age children, or adolescents? Will your group include boys or girls, or both? Be very clear when defining your population of interest.

The reason the patient population must be carefully described is that you want the search engines to give you relevant information and not information that is too broad or off target. (This will be discussed further in Chapter 6.) When retrieving information in a literature search, keep in mind that research findings reported for one patient population may not be relevant to another (Adams, 2009). For example, if you are looking at the effects of thrombolytic agents in children, and you find a study that examines thrombolytic agents in adults, you cannot assume that the thrombolytic agents will work the same in different patient populations. This is only one of many important variables to consider that can affect any study.

**FAST FACTS in a NUTSHELL**

When looking at a particular population of interest, be sure to consider age, gender, race, ethnicity, disease process, comorbidities, and any characteristic that may affect the chosen population.

**Step Two: Identifying the Intervention or Process of Interest**

The second step is to decide what intervention or process you want to examine. What do you want to do for this patient population? Ask yourself these questions:

- Have I ever asked why nurses follow a particular process, without receiving a logical answer?
- Have I found that performing an intervention in one particular way seems to be more effective than another?
• Have I seen patients improve and recover more quickly when a particular intervention has been used?
• Have I noticed that when a particular physician is on call, the patients do better—or worse—in relation to a particular intervention?
• Have I noticed that the unit seems to have a large number of infected central lines, or sepsis?
• Have I noticed that the unit seems to be calmer when certain individuals are working and less controlled when other individuals are present? Why? Is there something different in the care delivered?
• Have I noticed that there might be a better and more cost-effective way to perform an intervention I do every day?
• Do I feel that practice standards in a particular area are lacking?
• Have I recently read an article about a particular topic and thought, “Hey, that is a good idea” or “Why do we not do that in my unit?”

These are just some questions that could be the impetus for finding a better way, or justifying an existing way, in which nursing practice and interventions are performed. Quite simply, ask yourself what burning question or pet peeve do you have, or what does not make sense when performing your daily nursing routine? What do you feel could be done better? Is there something you feel is wasteful and could be done a different way to decrease costs, improve patient outcomes, or reduce time required? Table 2.1 contains information to consider when looking at each of these questions.

In researching an intervention or treatment, remember to compare the reaction of the individual who receives the intervention with the reaction of the individual who does not receive the treatment. If the latter group received a placebo, the effect of that placebo must also be considered. Patients who receive a placebo, or harmless intervention, think they have received the actual treatment. As such, they constitute a control group against which the patients receiving the actual intervention can be measured. If, for example, the subjects who received a sugar pill experience any “effects,” they are known as “placebo effects.”
2. ASKING THE COMPELLING QUESTION

The more defined the intervention is, the more focused your question will be, which will help to avoid any placebo effects.

Step Three: Examining the Comparison of Interest

The comparison of interest is the alternative to your intervention. The comparison can be a control (no treatment) versus a placebo (fake treatment). The comparison can also
consist of **measuring your intervention of interest against what is considered to be the gold standard** of treatment for a particular situation or disease process.

Suppose, for example, that you plan to study a fall intervention strategy in an elderly population. First, you would want to learn what the literature says about fall interventions in your patient population. Then, you might conduct a mini-survey of your patient population and fall interventions. Finally, you could compare your fall intervention strategy group to a group of elderly patients who do not receive that specific intervention. You could also do a simple performance improvement (PI) or quality assurance (QA) survey of your patient population. This does not have to involve a large group. You could then compare what you found in the literature with what you found on your unit. The resulting data can be impressive, and are particularly useful when approaching the institution’s administration to consider implementing a practice change. Although a survey is not necessary—you could just present the evidence—including survey data from your institution’s patient population in addition to the review of the literature results in a stronger presentation.

Another example is the use of pain medication in the pediatric population. One group could receive a narcotic medication in the form of a lollipop (e.g., Fentanyl lollipops), while the other group does not. The comparison of interest would be an evaluation of any difference in the level of pain experienced by the two groups. Again, you would search the literature first and then conduct an informal survey of your patients. Keep in mind which patients are receiving such medications and which patients are undergoing which procedures. As this step may go beyond a simple survey of your patient population, it may require administrative and institutional review board (IRB) approval. Always check with your hospital administration before embarking on any type of data collection procedures to be sure you are operating within institutional policy guidelines and maintaining patient confidentiality.

To adjust the preceding example to compare the type of intervention, consider whether one group of children
received the narcotic lollipop and another group received a regular lollipop without medication in it. The comparison of interest would be whether the groups experienced different levels of pain. In this example, you would need to use the same developmentally appropriate pain scale to measure pain in both groups. This would be a 0 to 10 scale for older adolescent children and, perhaps, the FACES scale for school-aged children.

Step Four: Outcome of Interest

The last step is establishing the outcome of interest. What will be improved or what do you want to see happen to the patient? **What do you want to accomplish or measure?** The *Cochrane Handbook for Systematic Review of Interventions* (Cochrane Collaboration, 2008) notes that the outcome of your study should be important and not trivial. Include outcomes that might be meaningful to the people who make decisions about health care practice. For example, suppose you researched whether adults who received supplemental feedings have an improved outcome of gaining weight. You would ask the question, “Do fragile geriatric individuals aged 65 and older gain weight when provided with supplemental calorie shakes with meals?” Your outcome for this intervention would be gaining weight. By specifically stating your outcome in your question, you can more accurately focus the search for evidence in the literature. As a result, you would find more relevant studies than if you searched for “protein shakes” alone.

Other Recommended Steps

**Time Frame**

Fineout-Overholt and Johnston (2005) recommended adding a fifth element to the PICO/T method. The last component, “T,” in the expanded PICO/T acronym stands for
time—the time frame in which the question occurs. While it is helpful to establish a timeline for completion of the PICO/T process, parts of the process may be out of your control. Still, establishing deadlines helps you stay focused and on task.

**Environment and Stakeholders**

Schlosser, Koul, and Costello (2007) have proposed another approach, which they call the PESICO method. The acronym stands for person, environment, stakeholders, intervention, comparison, and outcome. These authors believe that environment should be included as a component of the research method, as it can directly affect the outcome, and that one must establish which of the stakeholders in a study stand to gain or lose. These important sources of influence need to be considered when undertaking an EBP project.

**EVALUATING VALIDITY AND RELIABILITY**

When examining research studies, consider whether the study is reliable and valid. These two terms should be understood and applied to your EBP project.

- **Validity** is the ability to measure what it is supposed to or is intended to be measured.
- **Reliability** is the ability to measure what you want to measure on subsequent experiences.

Consider the following example. If your institution is purchasing new blood glucose meters, the meters should be tested to ensure that they accurately measure blood glucose levels every time (validity). The meters should also measure a blood glucose level of 100 the same way each time this test is performed on a patient (reliability). **To be valid and reliable, the meters should consistently meet these criteria.** (The need for valid and reliable equipment in the clinical environment is essential to safe practice and underscores why any nonfunctional piece of equipment
should be removed immediately from service.) These terms will be explored in more detail in Chapter 7.

The five cases that follow are designed to help define and focus your clinical question using the PICO/T method.

CASE STUDIES

CASE STUDY 2.1

You work in a pediatric unit at a local hospital. Children are being readmitted for rotavirus, a gastrointestinal illness that results in severe diarrhea and abdominal cramping. Children with this infection frequently present with severe dehydration. The virus is transmitted through contact by the fecal–oral route. Each of the readmitted children was in the hospital a week before this second admission for another illness. As you think about this, you realize that these children must be getting this infection nosocomially. You suspect handwashing may be a problem on your unit. You want to explore this occurrence through an EBP study. Fill in the blanks for the potential question of interest.

Does the incidence of readmission of _______ (P) _______ patients decrease when proper handwashing is demonstrated by health care personnel as compared to _______ (C) _______ their hands over the winter months (T)?

P = pediatric patients younger than 8 years of age
I = washing their hands
C = washing hands versus not washing hands
O = incidence (or decrease) in the readmission of patients.
T = over the winter months or from October to March is more specific
CASE STUDY 2.2

You work in a busy emergency department (ED) in a level-one trauma center. You notice an increase in the number of young adult patients admitted with severe head injury. Your state has just changed the law so that motorcycle riders are not required to wear helmets. Fill in the blanks below.

Does wearing ______ (I) _______ versus not wearing a helmet while riding a motorcycle decrease the number of admissions to the ED for severe head injury ______ (P) _______?

P = adult patients younger than 25 years of age
I = wearing a helmet
C = wearing or not wearing a helmet
O = decrease the admission of motorcycle riders

Note: Not every question will have an intervention component (as in a meaning question) or a time component (when it is implied in another part of the question). In this question the time is implied since the state just changed the law.

CASE STUDY 2.3

A 78-year-old man is at the physician’s office for a regular checkup. His blood pressure is 160/98 mm Hg. His physical examination results are otherwise normal. He normally takes blood pressure medication. When asked if he has been taking his medication regularly, he says “yes,” and mentions that he also takes a multivitamin and some “natural remedies.” He lives alone and is independent in all of his activities of daily living. His daughter, who visits him weekly, is with him for the appointment.

(continued)
CASE STUDY 2.3  (continued)

You ask both of them if you can do anything to assist him in “remembering” to take his medication. You consult the literature and find out that 75% of elderly individuals living alone forget to take their medications on a daily basis.

Does _______ (I) _______ medications for the _______ (P) _______ improve their compliance in taking their medications and maintain a stable blood pressure when compared with those who do not have their medications poured for them each week?

P = elderly individuals older than 70 years of age who are living alone
I = compliance with taking medications by placing them weekly in a plastic box marked with the days of the week and times of the day
C = elderly using the “pre-pouring” method and elderly not using this method
O = those who have their medications poured weekly for them will have increased compliance in taking their medications and maintaining stable blood pressure
T = implied each week

CASE STUDY 2.4

You work in a rural hospital in the labor and delivery department. Within the past 6 months, you notice that the new certified nurse anesthetist and physicians have started offering epidural anesthesia for all routine vaginal deliveries. You note that of the last 100 vaginal deliveries, 89 involved epidural anesthesia. You wonder if this is necessary or presented as a choice to the mother. You decide to consult the literature looking for evidence.
CASE STUDY 2.4  (continued)

Over the past 6 months has _____ (I) _____ anesthesia appropriate for all _____ (P) _____ patients as compared to a natural delivery method affected the level of uncomplicated delivery?

P = laboring patients scheduled for vaginal delivery
I = epidural anesthesia
C = epidural anesthesia or no anesthesia and a natural delivery method
O = decreased level of patients with uncomplicated deliveries
T = over the past 6 months

CASE STUDY 2.5

You work in an adult intensive care burn unit. You notice that standard protocol stipulates that tube feedings are usually not started until the fifth day after admission to the burn unit. You wonder why tube feedings are not started earlier and whether that increases or decreases the length of stay of patients in the burn unit. You also wonder if patients are getting the proper nutrition, as you know they are in a hypermetabolic state because of their injuries. What effect does this have on their weight and nutritional status? You consult the literature to find studies on the timing of feeding adult burn unit patients. The literature shows that tube feeding started in the first 24 hours of admission to the burn unit decreased the morbidity and length of stay in burn units across the country.

Does starting tube feedings on day ______ (C) _______ versus day ______ (C) _______ increase or decrease the length of stay of the ______ (P) _______ patients in the burn unit?

(continued)
**CASE STUDY 2.5  (continued)**

**P** = adult burn patients older than 18 years of age in the burn unit  
**I** = starting tube feedings on day 1  
**C** = starting tube feedings on day 1 versus day 5  
**O** = increase in weight gain, increased nutrition, decrease in length of stay  
**T** = length of stay (you could be more specific or not)

For this example, you could also compare the weight gain or loss; for example: Does starting tube feedings on day 1 versus day 5 alter the weight of adult burn patients over 18 years of age admitted to the burn unit?

**FAST FACTS in a NUTSHELL**

Once you select a topic for your EBP project, be specific in defining your patient population and environment. If your question is too broad, it may not be answerable or you may not find evidence on that particular subject. By narrowing your question and asking it in an answerable format, you will increase the ease of developing your EBP project. A key is to see how well your question fits into an EBP model, such as the PICO/T format.
A Basic Understanding of Research

You might think that now that you have decided on a compelling question, you are ready to search for evidence. But before beginning your evidence-based project (EBP), you need to understand some basic principles. That way, when you find “evidence,” you will know what type it is, how to classify and interpret it, and whether the research finding constitutes “good evidence.” This chapter provides an overview of the research process, as well as the proper terminology. For additional explanations about the process, consult a research text. Remember that you will not be conducting a research study. Rather, you will be conducting an evidence-based practice project.

In this chapter, you will learn:

1. A basic history of nursing research
2. The two basic types of research
3. The steps in the research process

A HISTORY OF NURSING RESEARCH

When did nursing research begin? Florence Nightingale introduced the concept of scientific inquiry as the basis of
nursing practice. She began collecting information and making observations about soldier mortality and morbidity during the Crimean War. With this scientific data, she fought for changes in nursing practice that affected outcomes for soldiers in the war (Houser, 2008). Her work to improve sanitary conditions in the 1800s was one of the first times a nurse linked environmental conditions (variables) to clinical or patient outcomes. Nightingale also kept detailed notes on her patients. Her book Notes on Nursing presents her initial observations and findings. Although Nightingale did not practice evidence-based research, her findings were based on her experience and observations. Although simplistic by today’s methods, her approach reflects a rudimentary form of the nursing research process.

TWO BASIC CATEGORIES OF RESEARCH

The two main categories of nursing research are quantitative and qualitative. In quantitative studies, the researcher identifies variables of interest and collects relevant data from subjects. These data usually take on a numerical format (Polit & Beck, 2014). For example, suppose the researcher is measuring happiness using a quantitative approach. The researcher would need to quantify happiness using a numerical happiness scale on which subjects could objectively quantify their level of happiness. An example would be a scale of 0 to 10 on a continuum, where 0 is no happiness and 10 is extreme happiness.

In qualitative studies, the researcher collects narrative data or descriptions by having conversations with the research participants, making observations, and taking notes. These interactions usually occur in the participants’ natural environments, such as home, workplace, or a mutually agreed upon venue. Diaries may also be used (Polit & Beck, 2014). If the happiness study discussed above was a qualitative study, the researcher would ask participants to describe their happiness by using a broad inquiry, such as “tell me about your happiness,” and paying careful attention not to persuade or influence the participants’ answers.
3. A BASIC UNDERSTANDING OF RESEARCH

Table 3.1 compares data obtained from qualitative and quantitative research approaches in a study on pain. These research methods are discussed in greater depth in Chapters 4 and 5.

Quantitative Research

Quantitative research is objective. It imposes tight control over the research situation. It generalizes findings and frequently includes numbers, facts, and figures (see Chapter 4). When you think of quantitative research, think numbers. The study sample usually has a large number of participants or subjects.

Qualitative Research

Qualitative research is more subjective. It describes an individual’s experience in the participant's own words. This narrative or verbal description is obtained after the researcher asks the participant an open-ended question and allows the participant to share his or her thoughts and feelings (see Chapter 5). Qualitative research usually has fewer participants in the sample than quantitative studies. Statistical analysis is used and common themes are sought and identified. For further clarification of this analysis, consult a basic research text.

### TABLE 3.1 Example: PAIN

<table>
<thead>
<tr>
<th>Quantitative Study</th>
<th>Qualitative Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerical scale, 0 to 10</td>
<td>Verbal description, “tell me more about your pain”</td>
</tr>
<tr>
<td>“The pain was 3 out of 10”</td>
<td>“The pain was crushing and the worst pain I ever had”</td>
</tr>
</tbody>
</table>

**FAST FACTS in a NUTSHELL**

- Quantitative research is objective
- Qualitative research is subjective
STEPS IN THE RESEARCH PROCESS

The steps in the research process are summarized in Table 3.2 and described in the pages that follow. Some steps may overlap, some can be varied, and some can be combined.

Step One: Identify the Problem
(Problem Statement)

The first and perhaps the most important part of the research process is to clearly identify the problem. What is it that the researcher wants to study? This problem should be of interest to the researcher and should also be of significance to nursing. For example, a pediatric nurse may be interested in studying the best method of measuring temperature in a child, but the question is whether the conclusion would really make a difference to the field of nursing. A review of the literature reveals that this topic has been studied frequently, with 35 studies agreeing on the most accurate method. This topic clearly does not need to be studied again. Now, suppose that same nurse learns that a new device for temperature taking, such as a femoral thermometer, has just been invented. If the nurse wants to study whether the femoral method is as accurate as the rectal method, this is a new and important question. By conducting this research study, one could determine if this new method is indeed accurate and, if so, if it should be recommended as the preferred method for use in pediatric units across the country.

<table>
<thead>
<tr>
<th>TABLE 3.2 Steps in the Research Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify the problem</td>
</tr>
<tr>
<td>2. State the purpose of the study</td>
</tr>
<tr>
<td>3. Determine the study variables</td>
</tr>
<tr>
<td>4. Conduct a review of the literature</td>
</tr>
<tr>
<td>5. Identify a theoretical or conceptual framework</td>
</tr>
<tr>
<td>6. Conduct the study ethically</td>
</tr>
<tr>
<td>7. Identify study assumptions</td>
</tr>
<tr>
<td>8. Formulate the hypothesis or research questions</td>
</tr>
<tr>
<td>9. Identify the type of research design</td>
</tr>
</tbody>
</table>
The problem statement can be one declarative or interrogative sentence that includes a clear identification of the population to be studied and the variables involved. The last thing for the researcher to consider is whether the problem is empirically testable. The problem statement is the “what” of the study. What is going to be examined by the researcher, and can it be done?

**FAST FACTS in a NUTSHELL**

**Declarative statement:** Femoral thermometer readings are more accurate than the rectal method in pediatric patients from 1 to 4 years of age.

**Interrogative statement:** Are femoral thermometers as accurate as rectal thermometers in pediatric patients from 1 to 4 years of age?

There are many things to consider when writing a good problem statement. See Table 3.3 for guidelines in writing and critiquing the problem statement.

**Step Two: State the Purpose of the Study**

This step defines the reason for the study. What is the purpose? Why does one want to study this topic? What is the

<table>
<thead>
<tr>
<th>TABLE 3.3 Guidelines for Writing and Critiquing a Problem Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Is the problem statement clear and concise?</td>
</tr>
<tr>
<td>• Is the problem statement written as a declarative or interrogatory sentence?</td>
</tr>
<tr>
<td>• Are the study variables and population of interest included in the problem statement?</td>
</tr>
<tr>
<td>• Does the problem statement indicate that the study would be feasible or able to be carried out?</td>
</tr>
<tr>
<td>• Does the problem statement indicate that it is clinically significant or relevant to nursing practice?</td>
</tr>
</tbody>
</table>

Adapted from Nieswiadomy (2012).
goal, or aim? For example, the statement of purpose for the problem identified earlier, which involves methods of measuring temperature in pediatric patients, might read as follows: “The purpose of the study is to determine which method of measuring temperature in pediatric patients from 1 to 4 years of age is more accurate.” Sometimes the problem statement and the purpose are seen as the same, but they really are not. The problem statement is the “what” of the study. It formally identifies the problem being addressed. It includes the scope of the research problem, the specific population being studied, the independent and dependent variables, and the goal or question the study is trying to answer (Gillis & Jackson, 2002). In comparison, the purpose of the study is the “why” of what is being examined, and it derives from the problem statement (Adams, 2009). Both statements should be mentioned near the beginning of the study.

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Problem statements identify “what” the study is about; the purpose statement identifies “why” the study is being conducted.

**Step Three: Determine the Study Variables**

In an experimental study, the concepts or items of interest to be studied are called variables. A variable is a something that can change. For example, weight, age, and body temperature are all variables that can be studied (Polit & Beck, 2012). **Variables can be independent or dependent.** An independent variable is the “cause” or the variable that influences the dependent variable. The **dependent variable** is the “effect,” or that which is influenced by the independent variable. The dependent variable can also be called the **criterion** or **outcome variable**. It is the variable that is observed for change or reaction after the intervention has been applied (Fain, 2009). The reason for this
A BASIC UNDERSTANDING OF RESEARCH is that in experimental research, researchers actively introduce an intervention or treatment to address therapy questions. In nonexperimental research, the researchers are bystanders, they collect data without making changes or introducing treatments (Polit & Beck, 2014). For examples of independent and dependent variables, see Table 3.4.

For example, if the researcher was looking at the relationship between age and the amount of exercise people engage in, the independent variable would be age and the dependent variable would be exercise. In this case, age is not the cause of the amount of exercise performed, but the direction of influence or the item or issue identified that influences the second variable (exercise) (Nieswiadomy, 2012). It is clear from this example that age may have a direct influence on the amount of exercise a person is able to do. So, this is another way that variables play an important role in the research process. For more on variables, see Chapter 4.

What, indeed, are the variables included in a study? There may be one, two, or many variables in a study. A one-variable study is also called a univariate study. An example of a problem statement with only one variable would be, “What are the sources of stress in the emergency department?” Here the researcher is only looking at one variable as the source of stress.

### TABLE 3.4 Examples of Independent and Dependent Variables

<table>
<thead>
<tr>
<th></th>
<th>Independent variable (IV)</th>
<th>Dependent variable (DV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the hospital does the presence of a support group for head-injured patients affect the stress level of patients with head injuries?</td>
<td>presence of support group</td>
<td>stress level of patients</td>
</tr>
<tr>
<td>Is there a difference between the development of breast cancer in women who eat meat and those who do not eat meat?</td>
<td>those who eat meat and do not eat meat</td>
<td>development of breast cancer</td>
</tr>
<tr>
<td>Is there a difference in NCLEX test scores between baccalaureate nursing (BSN) students and associate degree nursing (ADN) students?</td>
<td>BSN students and ADN students</td>
<td>test scores</td>
</tr>
</tbody>
</table>
A two-variable study is also called a bivariate study. Usually, one variable is the independent variable and the second a dependent variable. An example of a bivariate study question is, “Does the speed of driving correlate to the incidence of automobile accidents in adolescents?” An automobile accident is the independent variable, and the speed of the car is the dependent variable. A second example of a bivariate study question is the interrogatory problem statement, “Does the level of stress affect final exam scores for senior BSN students?” The cause or level of stress in this case will have a direct effect on the final exam scores, which is the dependent variable. Table 3.5 offers examples of types of problem statements using variables.

**TABLE 3.5 Variables in Problem Statement Format**

<table>
<thead>
<tr>
<th>Type of Study</th>
<th>Statement Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlational</td>
<td>Correlational statement</td>
<td>Is there a correlation between $X$ (independent variable) and $Y$ (the dependent variable)? Example: Is there a correlation between the level of stress and final exam scores of nursing students?</td>
</tr>
<tr>
<td>Comparative</td>
<td>Comparative statement</td>
<td>Is there a difference in $Y$ (dependent variable) between people who have $X$ (independent variable) and those who do not have $X$? Example: Is there a difference in stress levels of nursing students who had a review course and those who did not have a review course?</td>
</tr>
<tr>
<td>Experimental</td>
<td>Experimental study statement</td>
<td>Is there a difference in $Y$ (dependent variable) between a group that received $X$ (independent variable) and those who did not receive $X$ (independent variable)? Example: Is there a difference in pain in pediatric patients who received EMLA cream and those who did not receive EMLA cream prior to venipuncture?</td>
</tr>
</tbody>
</table>

**FAST FACTS in a NUTSHELL**

An independent variable is the “cause” or the variable that influences the dependent variable. The dependent variable is the “effect” or that which is influenced by the independent variable.
There are other types of variables. **Extraneous variables**, for example, are those that are not under investigation or examination but still may (or may not) be relevant to, or interfere with, the study. Extraneous variables may be controlled or uncontrolled by the researcher. It is best for the researcher to try to identify any extraneous variables and control them, so that they will not interfere with the purpose of the experiment or result in any adverse or unplanned effects. Extraneous variables may also be called **confounding variables**, **intervening variables**, or **mediating variables** (Fain, 2009; LoBiondo-Wood, & Haber, 2006). An example of an extraneous variable occurs in the study of older men who are enrolled in a new exercise program (independent variable) to determine how exercise affects their lung condition (dependent variable) by measuring functional lung capacity. The extraneous variables that could affect the dependent variable would be age, a history of smoking (including the length of time and the amount the patient smoked), second-hand smoke exposure, and comorbid conditions, such as chronic obstructive pulmonary disorder (COPD), lung cancer, asthma, or any diagnosis that might affect the dependent variable of actual functional lung capacity. So, the researcher would be wise to address these issues by eliminating from the study men who had smoked and had a preexisting or comorbid condition of COPD and asthma.

**Step Four: Conduct a Review of the Literature**

The review of the literature can be an overwhelming task for the novice researcher. If you are having difficulty conducting the literature review, consult a colleague or a librarian who is experienced with the process of finding research articles. They are excellent resources and usually are willing to help.

Research in any field must build on what already has been done. Therefore, **nurse researchers must locate relevant studies about the problem of interest to determine where the gaps in the literature are** and what areas need to be
examined. Making yourself aware of relevant studies helps prevent duplication of what already has been done. Chapter 7 provides guidelines for conducting the literature review.

Another skill is learning how to identify good literature and research. This process also allows the researcher to discover what instruments or tools have been used to study the topic of interest, as well as the conceptual or theoretical frameworks applied. In the case of EBP, it also enables the researcher to determine if the evidence available advises a change in practice. Some questions may reveal a lack of evidence or research on a given topic. This should alert the researcher to the need for further research on the topic of interest.

Often, researchers ask how far back in the literature they should search. Generally, the researcher should look for relevant studies or literature within the past 5 years. However, if no research has been published within this time frame, the researcher will need to go back further. In either case, it is always appropriate to include landmark studies, even if they more than 5 years old. **Landmark studies** are those that are paramount to the direction of study of the topic.

**Step Five: Identify a Theoretical or Conceptual Framework**

Nursing research is not conducted just to learn the answer to a specific question or to test a hypothesis. When a study is placed in a theoretical context, it allows one to speculate on the questions of why and how treatments work and how variables relate to each other (Polit & Beck, 2014). **Theory provides the structure for a research study.** It allows the researcher to generalize beyond a specific situation and predict what should happen in similar situations (McEwen & Wills, 2002). Good research integrates findings into an orderly and coherent system. Meleis (2007) states that the goal of theory in research "is to formulate a minimum set of generalizations that allow one to explain a maximum number of observational relationships among the variables in a given field of..."
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inquiry” (p. 45). She further states that the relationship between theory and research is cyclical in nature. The result of research can be used to verify, modify, disprove, or support a theoretical proposition. Nursing theory has provided new propositions that would not have been articulated if theories from other disciplines were used. Nursing theory is, therefore, very important.

For example if a research study was conducted examining the level of comfort a patient experiences postoperatively without pain medications, the study could be guided by Kolcaba’s comfort theory (2008) or Roy’s adaptation model (Barone, Roy, & Frederickson, 2008).

The word theory can be used in many ways. Scientists use theory to mean “an abstract generalization that offers a systematic explanation of how phenomena are interrelated (Polit & Beck, 2014). It can also be categorized as descriptive, which Fawcett (1999) defines as an empirically driven theory that can be used to “describe or classify specific dimensions or characteristics of individuals, groups, situations, or events by summarizing commonalities found in discrete observations” (p. 15).

A metaparadigm is a primary phenomenon that is of interest to a particular discipline. (Fawcett, 1999). Within nursing, the primary or central phenomena are the concepts of person, environment, health, and nursing (Fain, 2009). The theories that deal with these four metaparadigm concepts are referred to as nursing theories.

There are also traditional nursing theories that differ in their level of generality. Grand theories are complex and broad in scope. They include many concepts that are not usually grounded in empirical data (i.e., data gathered through the senses using objective measurement) or evidence. Therefore, they are not very useful in creating guidelines for nursing practice (Fain, 2009). Middle-range theories are theories that focus on only one piece of reality or the human experience, but involve a selected number of concepts (e.g., theories of stress) (Polit & Beck, 2012). Practice theories are more targeted than middle-range theories and produce specific directions or guidelines for
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practice. An example is the theories of end-of-life decision making (Fain, 1999). **Prescriptive theories** are theories that address nursing therapeutics and the outcomes of interventions. A prescriptive theory includes propositions that call for change and predict the consequences of a certain strategy for nursing intervention (Meleis, 2007). **Borrowed theories** are taken from another discipline, for example psychology, and applied to nursing questions and research problems (Fain, 2009). Table 3.6 lists several such theories from other disciplines.

The building blocks of theories are called **concepts**. These are “words or phrases that convey a unique idea or mental image that is relevant to the theory” (Schmidt & Brown, 2009, p. 106). In other words, they describe a phenomenon that is an aspect of reality that can be consciously observed, sensed, or experienced. Phenomena within a discipline such as nursing (e.g., caring) reflect that domain (caring for a patient in nursing as compared to caring about what one will eat for dinner) (Meleis, 2007). As such, a concept gives some degree of classification or categorization (Meleis, 2007).

**Constructs** are higher level concepts that are derived from theories and represent nonobservable behaviors (Fain, 2009). A conceptual model is the same as a conceptual framework, which is a set of abstract and general concepts assembled to address a phenomenon of central interest (Polit & Beck, 2012). It represents ideas or notions that have been assembled in a specific way to represent or describe a particular area of concern. Conceptual models are loosely constructed in comparison to theories (Fain, 1999).

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**TABLE 3.6 Theories From Other Disciplines**

<table>
<thead>
<tr>
<th>Theory</th>
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</thead>
<tbody>
<tr>
<td>Child development theory (Piaget; Freud; Erickson)</td>
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<tr>
<td>Family systems theory (Bowen)</td>
</tr>
<tr>
<td>Motivational theory (Maslow)</td>
</tr>
<tr>
<td>Social learning theory (Bandura)</td>
</tr>
<tr>
<td>Stress theory (Selye)</td>
</tr>
<tr>
<td>Stress and coping theory (Selye; Lazarus &amp; Folkman)</td>
</tr>
</tbody>
</table>

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So where does one find a nursing theory to use with a research study? See Table 3.7 for websites that provide information about nursing theories.

### Step Six: Keep the Study Ethical

All studies should be conducted ethically. Questions to consider include the following. Were study participants subjected to any physical harm, discomfort, or psychological distress? Did the researchers take appropriate steps to remove them from harm? Did the benefits to participants outweigh any potential risks? Did the benefits to society outweigh the costs to the participants? Was any type of coercion or undue influence used in recruiting or selecting the participants? Were vulnerable subjects used? Were the participants deceived or tricked in any way? Were they fully aware of participating in a study, and did they understand the purpose of the research? Were appropriate consent procedures used? Were appropriate steps taken to safeguard the privacy of participants? Was the research approved and monitored by an institutional review board (IRB) or other similar ethics review committee? All of these things need to be considered when evaluating a research study.

### Step Seven: Identify Study Assumptions

Assumptions are “statements and principles that are taken as truth, based on a person’s values and beliefs” (Fain, 2009, p. 192). Assumptions are presumed to be true but may not
indeed have been proven. Nieswiadomy (2012) describes three types of assumptions:

1. Universal assumptions. An example would be that all humans need love.
2. Assumptions based on a theory or research findings. For example, a study based on the finding that worrying leads to stress must identify the assumption that worry leads to stress so that a study on stress can use this assumption as its basis.
3. Assumptions that are necessary to complete the study. For example, if someone is studying women who commit murder, and the study is conducted in a prison ward with convicted female murderers, it can be assumed that the women did indeed commit murder. That is how assumptions work.

Every scientific study or investigation is based on assumptions. Therefore, the researcher should state these assumptions clearly so factors that may have influenced the questions asked and other parts of the study are identified.

**Step Eight: Formulate the Hypothesis and/or Research Questions**

The researcher’s expected findings form his or her hypothesis. The hypothesis is what ultimately predicts the relationship between two or more variables. The problem statement asks the question of interest, and the hypothesis then predicts the answer. The hypothesis should contain the population of interest and the variables, just as the problem statement does. A hypothesis must be able to be tested in a real-life situation (Nieswiadomy, 2012). Remember that the independent variable is the “cause,” and the dependent variable is the “effect.” There are several types of hypothesis, but only a few are discussed here.

A research hypothesis is a statement that shows an expected relationship among the variables. A null hypothesis, on the other hand, shows a complete lack of or absence or relationship among the variables (Polit & Beck, 2012).
The null hypothesis is important when looking at statistics related to a study.

The directional type of research hypothesis is preferred for nursing studies (Nieswiadomy, 2012). A **directional hypothesis** shows that a relationship exists among the variables, but that there is also an expected direction to that relationship. For example:

- There is a relationship between increased smoking and the increased risk of acquiring lung cancer. *(An obvious positive relationship is shown: increased smoking and increased risk of acquiring lung cancer.)*
- Older people are more susceptible to motor vehicle accidents because their reflexes are slower than those of younger people. *(This predicts a relationship between increased accidents and aging, as reflexes are slowed or decrease. While this is an inverse relationship, it is indeed a directional relationship.)*

A **nondirectional hypothesis** shows just the opposite; it shows that no direction exists among the variables. For example:

- There is a relationship between diet and the risk of obesity. *(This does not clearly predict a direction, whereas the following statement would.)*
- People who consume more than 3,000 calories per day will have an increased risk of being obese. *(This shows an increased caloric consumption and increase risk of being obese, and an obvious direction.)*

**FAST FACTS in a NUTSHELL**

The purpose of research questions is to generate new knowledge, whereas the purpose of EBP questions is to make decisions about factors that affect patient care.

Research questions are statements that seek to address an identified research problem. In some cases, they are a direct rewording of the statement of purpose phrased as a
question rather than a statement (Polit & Beck, 2012). For example, if the problem statement is to determine the difference between high-carbohydrate diets and obesity, the purpose may be to examine the link between these elements. The research question(s) may be:

- Is there a correlation between diets of complex carbohydrates and increased obesity?
- Is there a decreased incidence of obesity among people who do not consume carbohydrates?
- Is there a family history that predisposes one to obesity?

Answers to the following queries can be used to develop research questions:

- Is there a relationship?
- What is the direction of the relationship?
- What is the strength of the relationship?
- What is the type of the relationship?

Step Nine: Identify the Type of Research Design

The most basic way of identifying the type of research design is to ask if it is quantitative or qualitative. Then, look at the factors for each type of study that will need to be addressed, including the population, how the data will be analyzed, and the communication of the results. These topics are discussed in greater detail in Chapters 4 and 5.

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Florence Nightingale, although not an evidence-based researcher, is credited as the first nurse researcher because of her observations and notes made during the Crimean War. The two basic types of research are quantitative and qualitative. Each category includes multiple types of research. Basic steps in the research process are: (1) identify the problem to be examined
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(1) state the problem statement; (2) state the purpose of the study; (3) determine the study variables; (4) conduct a review of the literature; (5) identify a theoretical or conceptual framework; (6) conduct the study ethically; (7) identify study assumptions; (8) formulate the hypothesis or research questions (what it is the researcher wants to know or predict); and (9) identify the type of research design you want to use. Although these steps are not the only way to conduct research, they provide a framework to guide you as you begin to understand the research process.
The two main research designs are quantitative and qualitative. This chapter discusses the basics of quantitative research designs. Chapter 5 discusses the basics of qualitative research designs. Quantitative research has many designs, and the literature on the subject is vast. This chapter provides a brief overview of basic quantitative research designs, along with related key terminology needed to understand the basics of evidence-based practice (EBP). For further clarification of topics and concepts, consult a comprehensive and detailed nursing research textbook.

In this chapter, you will learn:

1. A basic overview of quantitative research
2. The two basic designs of quantitative research: experimental and nonexperimental
3. The Hawthorne effect
4. Randomization
5. How to complete a basic analysis of findings in quantitative research
QUANTITATIVE RESEARCH

Quantitative research designs examine relationships between variables and are categorized as experimental or nonexperimental. In experimental designs, the researcher usually manipulates the experimental variables, there is a comparison group in the study, and the subjects are usually randomly assigned to the experimental or comparison group. The nonexperimental design is used when research cannot be conducted on human subjects because it would either be unethical or it would cause pain or harm to the subjects. Nonexperimental designs are descriptive and describe the phenomenon as it exists. The researcher does not have control over the subjects and can only attempt to control for extraneous variables by carefully selecting the study sample. For a brief overview of experimental and nonexperimental designs, see Table 4.1.

<table>
<thead>
<tr>
<th>Experimental Designs</th>
<th>Nonexperimental Designs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• True experimental design</td>
<td>• Descriptive studies</td>
</tr>
<tr>
<td>• Pretest–posttest control group</td>
<td>• Action studies</td>
</tr>
<tr>
<td>• Posttest-only control group</td>
<td>• Comparative studies</td>
</tr>
<tr>
<td>• Solomon four-group</td>
<td>• Correlational studies</td>
</tr>
<tr>
<td>• Quasi-experimental designs</td>
<td>• Developmental studies</td>
</tr>
<tr>
<td>• Nonequivalent control group</td>
<td>• Evaluation studies</td>
</tr>
<tr>
<td>• Factorial</td>
<td>• Meta-analysis studies</td>
</tr>
<tr>
<td>• Randomized block</td>
<td>• Methodological studies</td>
</tr>
<tr>
<td>• Crossover/repeated measures</td>
<td>• Needs-assessment studies</td>
</tr>
<tr>
<td>• Time series</td>
<td>• Secondary analysis studies</td>
</tr>
<tr>
<td>• Preexperimental</td>
<td>• Survey studies</td>
</tr>
</tbody>
</table>
DESIGNS IN QUANTITATIVE RESEARCH

Experimental Designs

**True Experimental Design**

In a true experimental design, the researcher has greater control over the situation because the rival or alternative hypothesis can be ruled out as an explanation for the observed response (Fain, 1999). Three criteria are necessary for a true experimental design:

1. The researcher manipulates the experimental variables
2. At least one experimental and one comparison group are included in the study
3. Subjects are randomly assigned to either the experimental or the comparison group

The researcher also looks for a cause and effect (outcome). All experimental studies involve the manipulation of the independent variable (cause) and, then, the measurement of the dependent variable (effect). Several issues related to experimental design need to be mentioned. The first is that not all variables can be manipulated. For example, if you are studying patients who have pneumonia, the researcher cannot infect more patients with pneumonia so that they can be added to the study. That would not be ethical. So, when conducting an experimental research study or when reading a study to determine to what extent the researcher was able to control the variables involved, keep these points in mind.

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**FAST FACTS in a NUTSHELL**

All experimental studies involve the manipulation of the independent variable and, then, the measurement of the dependent variable.
Determining whether a study is ethical study is very important. In the past, some studies were conducted without regard to human rights. The famous Tuskegee syphilis study is one such example. This study involved an experiment that lasted more than 40 years. It was designed to examine the long-term effects of syphilis in adult African American men, but many of the men studied were not aware that they were subjects. This violates the right of informed consent. In addition, when penicillin became available to treat syphilis, the government withheld the medication from this group so that the study could continue. Without the penicillin, many of the men died. Since that time, legislation has imposed important safeguards to prevent such an atrocity from happening again (Nieswiadomy, 2012). Today, subjects in every study must give informed consent. This means that before a researcher begins collecting data, he or she must make sure that each participant understands the nature of the research project and the implications of participating in the study. The researcher must provide information about the potential benefits and risks and ensure that the subject is participating voluntarily, without any coercion. Researchers also must also provide ample time for the subjects to ask questions and clarify any confusion about participation in the study. For children, a parent or custodian must give consent for the child to participate.

“First, do no harm,” the most basic principle of medicine, applies to research as well as to the practice of medicine. In the research environment, it simply means that no subject shall be harmed during the process of data collection. This is extremely important. Consent to conduct a study must also be obtained from an institution’s internal review board, known as an institutional review board (IRB). The IRB is a group of individuals who review and approve all studies before they are conducted. This ensures that human rights are protected and proper procedures or protocols are being followed so that no participant is harmed.
Subjects in every study must give informed consent.

For a retrospective study, researchers look back in time to data already obtained and on record. In most cases, regulations requiring informed consent do not apply, as long as the data do not identify the patient. However, the U.S. Health Insurance Portability and Accountability Act of 1996 (HIPAA) is very clear about the type of information that can be removed from patient records for the data to be considered de-identified (Polit & Beck, 2012). HIPAA requires national standards for electronic medical information to keep health information private. An institution, such as a hospital, can disclose individually identifiable health information (IIHI) from its records if a patient signs an authorization allowing access. This authorization can be incorporated within a consent form or it can be a separate document (Polit & Beck, 2012). It is best to check with each institution as to its policies and procedures before looking at any patient data.

The Hawthorne effect is an important phenomenon in experimental designs. It refers to how participants in a study react as a consequence of being studied. If a researcher is conducting a study and the subjects know they are being studied, they may change their behavior, actions, or replies to questions during the study. That change of behavior is the Hawthorne effect. For example, suppose a nurse is conducting a study on the handwashing compliance of staff and is observing members of the staff walking in and out of patient rooms. The staff may become suspicious as to why the researcher is watching them. They may fear the researcher is monitoring their practices and, therefore, change their behavior and wash their hands more frequently than they normally would have done. This skews the results of the study. Waltz, Strickland, and Lenz (2005) note that subjects who are being observed usually notice the
observer’s presence and figure out they are being watched within approximately 10 minutes.

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The Hawthorne effect occurs when subjects change their behavior, actions, or responses to questions because they know they are being studied.

For a good experimental study to be conducted, there also needs to be randomization. **Randomization** is a procedure that ensures that every subject has an equal chance of being chosen for the experiment. There are numerous methods to achieve this goal. It can be done by computer-generated numbers, a random numbers chart, selection of every third person, or a simple flip of a coin. An experimental study usually has two separate groups of subjects: a true experimental group and a control group. When applying a variable, or intervention of interest, such as testing a new drug and its effects, the members of the experimental group would receive the drug and the members of the control group would not. The control group might also be referred to as the comparison group. To alleviate the Hawthorne effect, the researcher may choose to “blind” the study. **Blinding** occurs when subjects do not know whether they are in the experimental group or the control group. For example, if the researcher is testing a new medication for depression, the subjects will not know if they are getting the new medication or a placebo, which is a nontherapeutic (pretend, or fake) medication. A study can be single blinded or double blinded. Single blinding is a one-way process in which the subject does not know if he or she is in the experimental or control group. Double blinding is a two-way process that exists when neither the researcher nor the subject knows if the subject is in the experimental group or in the control group. In the preceding example, neither the researcher nor the subjects would know who is receiving the medication and who is receiving the placebo. **Double blinding is the**
most efficient way to eliminate any type of subjectivity or bias. *Bias* is an important term that means an influence of some sort on the study or outcome of the study. This occurs when the researcher interjects his or her personal beliefs into the study, either knowingly or unknowingly. For example, assume a researcher is studying the positive effects of using sugar to sweeten coffee. First, the researcher is guilty of bias in the way the study is worded. It states a “positive” effect. How does the researcher know it will be positive? Secondly, the researcher may say to the subject, “Doesn’t your coffee taste sweeter and better?” In this case, the researcher is planting ideas into the subject’s head and altering the outcome of the experiment. That is a form of bias.

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Double blinding is the most efficient way to eliminate any type of subjectivity or bias.

**Sampling** For evidence-based research, the “P” or population of interest in a PICO/T question is the entire group of interest. (See Chapter 2 for an explanation of the PICO/T method.) Sampling is a critical part of the design. **Sampling** involves selecting a part of the population to represent the population. A **sample** is a subset of the population. Researchers typically work with samples rather than populations for reasons of practicality. In quantitative research a representative sample is one whose characteristics closely match that of the population. **Sampling bias** occurs when a segment of the population is either over-represented or under-represented (Polit & Beck, 2014).

Another type of sampling is **convenience sampling**. This entails selecting the most conveniently available people as participants. An example would be a nurse who needs 50 burn patient participants and chooses the first 50 people who are admitted to the hospital with a burn injury. These participants are chosen because they are convenient, in that
they are in the hospital with a burn injury. They do not need to be recruited or sought out. The problem with this type of sampling is that the representation of people (participants) may not be indicative of all people in the population. Those who are selected for study are chosen because they are very easy to use, but this approach makes the representative sample very weak.

**Purposive sampling** is based on the researcher’s knowledge about a population. The researcher decides to select people who are felt to be particularly knowledgeable about a specific issue being studied. They are purposely chosen. This can lead to bias (Polit & Beck, 2014).

**Probability sampling** involves a random selection of people from a population. It is not the same as random assignment frequently used in randomized controlled trials (RCTs). In *random sampling*, each person in the population has an equal, independent chance of being selected. *Random assignment* to different treatment conditions has no bearing on how participants in the RCT were selected (Polit & Beck, 2014). It just describes how they are assigned to a treatment group or a control group.

**Nonprobability sampling** differs from probability sampling in that samples are rarely representative of the population. If every person in the sampling population does not have an equal chance of being chosen, it is likely that some segment or part of the population will be under-represented (Polit & Beck, 2014).

**Systematic sampling** involves choosing every *n*th case from a list, such as every tenth person on a patient list. So, if you want to select 100 people for a study, you would choose number 10 on a list of patient names, and then continue to choose numbers 20, 30, 40, and so on until reaching 100. The *sampling interval* is the interval at which the participants are selected, such as every fifth person, every tenth person, or whatever the researcher decides. So, this is simply the interval or number chosen. In the preceding example, the sampling interval would be 10, for every tenth person.

In choosing participants for a study, researchers often specify inclusion or exclusion criteria. *Inclusion criteria* are
what qualifies a person to be part of the study. *Exclusion criteria* are what excludes a person from being part of a study. Let’s say you want to conduct an EBP project focusing on a population of nurses, including those with a doctoral degree. The project would include nurses and nurses with doctoral degrees. It would exclude non-nurses and those with a doctoral degree who are not a nurse. It is important, when looking at who is included or excluded from a study, to evaluate whether the population or sample is evenly, fairly, and adequately represented or comprises a nonrepresentative sample.

**Quasi-Experimental Design**

In a quasi-experimental design, which is similar to an experimental design, there is no randomization or comparison group. This type of study might be conducted when randomization is not possible. The researcher uses an already established group for the experimental group. This type of design is used with people in their naturally occurring groups, which is more like the “real world.” For example, a researcher studying a group of Native Americans is working with a group that is predetermined by culture. This makes determining the cause-and-effect relationship weaker than in a true experimental design because the researcher is making generalizations about only one group of individuals, Native Americans. The researcher cannot assume that these findings would also be applicable to, say, African Americans. As a result, quasi-experimental designs are ranked lower on the hierarchy of rating evidence for EBP.

**Nonexperimental Designs**

A nonexperimental design is frequently used when experimental research cannot be conducted on human subjects. For example, suppose a researcher wants to study the effects of pain on children. It would be unethical to induce pain in asymptomatic children to conduct the study. The researcher
cannot intentionally subject any one group to pain. All non-
experimental studies are therefore descriptive in nature. Be-
cause the researcher cannot manipulate or control variables,
he or she can only describe the phenomena as they exist.
The researcher can, however, try to control extraneous vari-
ables by carefully selecting the study sample. An extrane-
ous variable is one that is not of interest to the researcher
but can affect the study by causing an unanticipated effect.
These are also called intervening, or confounding, variables.
The two broad categories of nonexperimental design are de-
scriptive and correlational. These are discussed below, along
with survey studies, comparative studies, and methodologi-
cal studies.

**FAST FACTS in a NUTSHELL**

Nonexperimental designs include descriptive, correla-
tional, survey, comparative, and methodological studies.

**Descriptive Design Studies**

Descriptive design studies describe in detail the phenome-
on of interest and the relationship among its variables. The
purpose of descriptive designs is to observe and describe phe-
omena in real-life situations. In nursing, a descriptive design
can be used to identify problems, make decisions, or determine
what other people in similar situations are doing (Houser,
2008). For a descriptive study, information already exists in
the literature about the phenomenon of interest, whereas, for
an exploratory study, no such information is available. An ex-
ample of an exploratory study would be a researcher studying
the use of a particular antibiotic, let’s say antibiotic X. If
antibiotic X is given intravenously, the researcher’s question
would be, “Does it cause venous irritation?” The researcher
would describe what happens, if anything, when the antibi-
otic is given. The researcher is exploring a new situation and
gathering new data and has no knowledge of a possible an-
swer based on published reports. This is an exploratory study.
Remember that if the study is observational or descriptive in nature, the characteristics of the sample group are usually examined by methods such as questionnaires, surveys, interviews, and direct observation. Conclusions are made about the subjects or sample from these observations. The sample is usually divided, but this may not be done randomly (Carlson, Kruse, & Rouse, 1999).

**Correlational Design Studies**

Correlational design studies are used to find relationships among two or more variables within a situation without knowing the reason for the relationship (Boswell & Cannon, 2007). In correlational studies, the researcher seeks to find the strength of the relationship between variables to see if a change in one variable results in a change in the other; that is, to see if there is a correlation between the two variables. The magnitude or direction of a correlation can be measured by using a positive or negative correlation coefficient. Coefficients range from –1.00 (a negative correlation) to 1.00 (a positive correlation). A correlation coefficient of .00 shows no relationship between the variables. Correlation coefficients can be reported through various statistics, such as Pearson's product moment correlation or Spearman's rho (Nieswiadomy, 2012). In reviewing evidence from a correlational study, keep in mind that a correlation does not prove causality. In other words, just because a correlation was found between “A” and “B” does not mean that “A” caused “B.” Correlational research simply seeks to find the “correlation.”

**Survey Studies**

Survey studies obtain data through subjects’ self-reporting about variables such as attitudes, perceptions, and behaviors. Surveys can be conducted face to face or over the telephone. The questionnaire is a popular method in collecting data (Peters, 2009). Survey tools are readily available, or the researcher may choose to develop his or her own. If the
researcher develops a new survey tool, he or she must be sure to test the new tool in a pilot study to confirm that it is valid and reliable. A pilot study is a small-scale trial run of a larger research project using a smaller number of subjects. In this case, the pilot study would be done to test the survey tool. Many of us have received surveys in the mail. Cross-sectional surveys look at people at one point in time; longitudinal surveys follow subjects over a period of time.

Some advantages of surveys are that the researcher can collect a large amount of information quickly at a minimal cost. Using survey tools, a researcher can reach large groups of a people in a shorter amount of time than is possible when conducting a face-to-face survey. Incentives may be offered for the participant to complete the survey. Short surveys are usually more effective than long and detailed surveys.

Comparative Studies

Comparative studies look at the difference between intact groups on some dependent variable of interest. Although this sounds a lot like a true experimental study, the difference is in the extent to which the researcher can manipulate the independent variable. In comparative studies, there is no manipulation of the independent variable. For example, when looking at spousal abuse, it would not be ethical to examine abuse as an independent variable in one group and then choose another group whose members would not be abused.

Comparative studies frequently are classified as retrospective or prospective. In retrospective studies, the researcher looks backward in time. In prospective studies, the researcher looks for an effect in “real time” or in the future.

Methodological Studies

In methodological studies, nurse researchers are looking at the method. This type of study is used most often to test instruments or analyze the development, testing, and evaluation of research instruments. For example, assume a researcher develops a tool to measure “happiness” in obstetric
patients after delivery. The new “happiness scale” would need to be tested to see if it is indeed a valid method of measuring happiness. This would be done in a methodological study. Remember, the researcher is testing the method.

A biophysiological method tests an instrument used for collecting biophysiological data of some kind, such as blood pressure, heart rate, and so on. When obtaining this type of data, it is important that the biophysiological instrument be calibrated to ensure accuracy, reliability, and validity before the study is started. An example of a biophysiological method or an instrument is a glucose meter. If you are conducting a study about glucose levels using a new glucose meter, you would want to ensure that the meter is working properly before conducting the study.

**FAST FACTS in a NUTSHELL**

It is important not to confuse exploratory and explanatory research.

**Exploratory** research studies are conducted when little is known about the phenomena of interest. For example, a researcher might decide to investigate the needs of the families of patients who are discharged with implanted vagal nerve stimulators. If a review of the literature demonstrates limited information on vagal nerve stimulators, it would be most appropriate to do an exploratory study.

In **explanatory** research studies, the researcher searches for causal explanations or explanations of “why” or “how” phenomena are related. This method is much more rigorous than exploratory or descriptive research and usually involves experimental-type research. Whereas in exploratory and descriptive studies, the researcher describes phenomena and examines relationships among phenomena, in explanatory research, the researcher provides an explanation for the relationships that are found among the phenomena (Nieswiadomy, 2012). For example, in the exploratory
research on antibiotic X mentioned earlier, suppose the researcher found that antibiotic X does indeed cause venous irritation. In explanatory research, the researcher explains why the venous irritation happens. In this case, it could be related to the pH of antibiotic X.

**ANALYSIS OF FINDINGS IN QUANTITATIVE RESEARCH**

The analysis of data, along with both descriptive and inferential statistics, can be overwhelming for a person new to research and goes beyond the scope of this book. More detail on this type of data analysis can be found by consulting a basic research text. A brief explanation of four basic concepts—level of significance, confidence intervals, effect size, and standard deviation—follows. Table 4.2 provides a list of questions to ask in critiquing a quantitative study.

**Level of Significance**

The level of statistical significance is written in terms of a probability value, commonly abbreviated in research reports as the *p* value. The *p* value measures how much evidence there is against the null hypothesis (a finding of no relationship between phenomena); that is, how much of a chance there is that the null hypothesis is wrong. In nursing research, for a result to be considered significant, it must have a *p* value of less than 0.05. If the *p* value is less than 0.05, the result is significant. If the *p* value is greater than 0.05, the result is not considered significant.

More simply, if a report indicates that the findings are significant at the 0.05 level, that means that only 5 times out of 100 (5 divided by 100 or 0.05) would the obtained results be incorrect. In other words, 95 out of 100 times, the same results (a positive correlation or relationship) could be obtained with another sample or test. This is the same as saying that a null hypothesis (no correlation or relationship
4. QUANTITATIVE RESEARCH

### TABLE 4.2 Guide to Critiquing Quantitative Research

<table>
<thead>
<tr>
<th>Critiquing Guidelines</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ask yourself:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What type of quantitative study was done?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Does the process relate to the type of study?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Does it make sense?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Was the design of the study identified and does it fit the hypothesis or answer the research questions?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What design was used?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Does it make sense for this type of study?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Would this type of study test the hypothesis presented?</td>
<td>❑</td>
<td>❑</td>
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<tr>
<td>What were the results of the study?</td>
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<td></td>
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<tr>
<td>• How were they obtained and measured statistically?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Is this significant?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Would the results help locally or impact clinical practice?</td>
<td>❑</td>
<td>❑</td>
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<tr>
<td>Is the measurement reliable?</td>
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<td></td>
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<tr>
<td>• Does it measure the same thing on repeated measures?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Is the study reproducible?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Are the results valid?</td>
<td>❑</td>
<td>❑</td>
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<tr>
<td>• Does the study measure what it was supposed to measure?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Is any bias present?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Are there any confounding variables?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td><strong>More Specific Questions</strong></td>
<td></td>
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<tr>
<td>What is the measurement effect?</td>
<td></td>
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<tr>
<td>• How many participants were enrolled in the study?</td>
<td>(n = ________ )</td>
<td>❑</td>
</tr>
<tr>
<td>• Were the two groups (control and experimental) evenly divided?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Are the results of the study clinically significant?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• If they are significant, at what level?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>How was the sample size decided?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Was there randomization?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Was there blinding of the subjects?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>How were the data analyzed?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What statistical tests were used, if any?</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>• Was there a significant p value?</td>
<td>❑</td>
<td>❑</td>
</tr>
</tbody>
</table>
between variables) will be rejected only 5 times. You can have a high degree of confidence that these results are reliable. So a $p$ value of less than 0.05 is good. A $p$ value of less than 0.01 is better. Look at the $p$ values in Table 4.3. Which are less than 0.05?

Keep in mind that while the $p$ value tells you that a difference exists between the experimental and control groups, it does not tell you the magnitude of the effect. To understand the magnitude of the effect, you would need to understand the clinical and statistical significance, which involves looking at confidence intervals and effect size (Rempher & Silkman, 2007).

**Confidence Interval**

Confidence intervals are computed based on the mean and standard deviation. If a study has a confidence interval (usually abbreviated as CI in research reports) of more than 95%, that is good. This means that the data is correct 95% of the time. So a 99% CI is better than a 90% CI.

Confidence intervals reflect the degree of risk researchers are willing to take of being wrong. With a 95% CI, researchers accept the probability that they will be wrong only 5 times out of 100 (Polit & Beck, 2012).

**Effect Size**

An effect size is the magnitude of the relationship between two variables, or the magnitude or difference between two groups with regard to some attribute of interest (Polit & Beck, 2012). Although an intervention or variable is expected to have an impact on the outcome and be reported as clinically significant, this may not translate into actually being clinically significant (Houser, 2008). For example, suppose a researcher is studying the effect of aerobic exercise on heart rate and losing weight. If the relationship is strong, an effect will be seen with a small sample size. However, if
it is found that exercise has little effect on the heart rates of patients with hyperthyroidism, a much larger sample will be needed to find any significant changes in heart rate in this study. In other words, when a strong relationship among variables exists, a small sample might be possible to show that relationship. But, where the strength of the relationship among variables is not as strong, or where another intervening variable might affect the results, a much larger sample of subjects will be needed.

**Standard Deviation**

A standard deviation shows the average amount by which values deviate from the mean. The mean is simply the average of a set of numbers. For example, if you add 10, 11, and 12, you come up with 33. If you then divide that sum (33) by the total numbers in the example (3), your mean, or average, is 11. The standard deviation (usually abbreviated as SD in research reports) is a useful variability index for describing a distribution and interpreting individual scores in relation to other scores in the sample. Similar to the mean, the standard deviation is a stable estimate of a parameter and is the preferred way of determining a distribution’s variability. This is only appropriate for variables measured on an interval or ratio scale.

When researchers consider an analysis that reports a standard deviation, they are looking for a result as close to the number 1 as possible. It can be positive or negative. So, an SD of +0.9 is good. An SD of +3.0 is worse. An SD of −1.0 is good, but an SD of −5.7 is bad. The absolute measure is zero, so the closer you get to zero the better. Table 4.3 provides examples of standard deviation.

**Levels of Measurement**

According to Polit and Beck (2014), there are four main classes or levels of measurements that involve the use of
numbers in reporting results: nominal, ordinal, interval, and ratio measurement. **Nominal measurement** is the lowest level and involves using numbers to categorize attributes. For example, a researcher might code males as “1” and females as “2.” These numbers have no quantitative meaning.

**Ordinal measurement** ranks a subject based on a relative standing or attribute. An example would be assigning the following numbers to a person’s ability to comb his or her hair: 4 = completely independent, 3 = needs minimal assistance; 2 = needs maximal assistance, 1 = needs complete assistance. Ordinal measurement does not tell us how much greater one level is than another. In the preceding example, we do not know whether or not being completely independent is twice as good as needing maximal assistance.

**Interval measurement** occurs when researchers can rank subjects based on a particular attribute and can specify the distance between them. Suppose you are being graded on a standard test, and the highest grade you can get is 100. While a grade of 100 it is higher than 80, the difference between 100 and 80 is the same as that between 80 and 60. When researchers use this type of ranking, the interval measurements can be averaged. There are several statistical procedures that require interval data.

**Ratio measurement** is the highest level of measurement. Ratio scales differ from interval scales in that they have a meaningful zero. A common example is ambient temperature as measured on a standard thermometer. Both Fahrenheit and Celsius thermometers consist of a scale

### Table 4.3 Example of \( p \) Values and Confidence Intervals

<table>
<thead>
<tr>
<th>Interview No.</th>
<th>Standard Deviation</th>
<th>( p ) Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview 1 (( n = 35 ))</td>
<td>1.33</td>
<td>.014</td>
</tr>
<tr>
<td>Interview 2 (( n = 40 ))</td>
<td>1.05</td>
<td>.057</td>
</tr>
<tr>
<td>Interview 3 (( n = 50 ))</td>
<td>0.91</td>
<td>.008 (significant)</td>
</tr>
<tr>
<td>Interview 4 (( n = 34 ))</td>
<td>1.00 (good)</td>
<td>.011</td>
</tr>
</tbody>
</table>
for measuring temperature (interval measurement). In these scales, zero on the thermometer does not indicate the absence of heat; it is just a set point. Furthermore, it would be inaccurate to say that 40 degrees is twice as hot as 20 degrees.

**FAST FACTS in a NUTSHELL**

The two main types of research are quantitative and qualitative. Quantitative research is further divided into experimental and nonexperimental. A variable is something that can be measured, such as blood pressure or heart rate. The independent variable influences the dependent variable. The independent variable is the “cause,” and the dependent variable is the “effect.” Randomization is a method used to choose subjects for a study. With randomization, every subject or participant has an equal chance of being selected. Bias occurs when researchers interject their feelings or personal beliefs into the study in a way that might affect the outcome of the study. Retrospective studies look backward in time, and prospective studies look at issues in “real time” or in the future.
Of the two main types of research design introduced in earlier chapters, qualitative research is the more subjective. In contrast to quantitative research, which involves datasets of numbers, qualitative research is more likely to be based on life experiences. It involves smaller groups of subjects, often includes narratives, and attempts to identify common themes. The researcher collects data until saturation is achieved. This chapter explores the characteristics of four types of qualitative research designs: phenomenological, ethnological, grounded theory, and historical. Case studies, narratives, feminist research, and community-based participatory action research are other types of qualitative research.

In this chapter, you will learn:

1. A basic understanding of qualitative research
2. How to examine the process of knowing
3. How to explore the basic types of qualitative research, which include:
   • Phenomenology
   • Ethnography
   • Grounded theory
   • Historical research
WHAT IS QUALITATIVE RESEARCH?

Qualitative research is not easily defined. It requires an examination of the quality of something rather than its quantifiable elements. It infers a subjective interpretation. LoBiondo-Wood, and Haber (2006) note that qualitative research is about human experiences. It frequently is conducted in natural settings and uses words or text rather than numerical data to describe the experiences being studied.

Before the 1970s, qualitative methods were used primarily in anthropology and sociology. Then, during the 1970s and 1980s, qualitative research methods were adopted by researchers in education, social work, management, nursing, and women’s studies (Tilley, 2007). Qualitative research lends itself effectively to the nursing process, which focuses on the person as a whole. Over the years, its methods have become valued in the science of nursing, as the nursing process looks at the continuum of care from assessment to diagnosis to planning to interventions to an evaluation of care given.

Clearly, not everything a nurse experiences can be reduced to numbers and physiological measurement. The experienced nurse knows that there is more to nursing that is sometimes left unsaid and unexplained.

FAST FACTS in a NUTSHELL

Qualitative research requires an examination of the quality of something rather than its quantifiable elements. It lends itself effectively to the nursing process, which focuses on the body, mind, and spirit of the individual.
How does a nurse “know” or sense when a patient is going to “crash” or deteriorate? How does a patient “get the feeling” that he or she is going to die? Sometimes, nurses just know, but how does one get to this place of knowing. Is it through learning or acquiring facts? Is it instinctive? Or, is it something more? Most importantly, how can it be measured in the research process?

Have you ever cared for a patient and just “sensed” that something was wrong? How did you know? Was it a feeling—a sometimes overwhelming feeling? Perhaps you have worked in the emergency department (ED) or in the intensive care unit (ICU). If so, have you experienced the feeling that your patient was going to “crash” or was about to die? How and why did you get that feeling? How did you know? How can you measure that?

Michael Polanyi: Tacit Knowledge

Michael Polanyi, a professor of physical chemistry and social science, made significant contributions to the fields of philosophy and social science. He referred to this type of personal knowing as tacit knowledge. He believed that creative acts (especially acts of discovery) are shot through, or charged, with strong personal feelings and commitments (personal knowledge). Polanyi said that these personal hunches, informed guesses, and imaginings are part of exploratory acts that are motivated by what he called passions. He felt these “hunches,” which form a prelogical phase, occurred because we “knew more than we could tell” (Infed, 2003). It is an interesting concept to explore. More information about Polanyi’s ideas can be found on the web at http://polanyisociety.org.

Barbara Carpers: Patterns of Knowing

To explain how we know what we know, Barbara Carpers (1978) examined four types, or patterns, of knowing: empirical,
personal, ethical, and aesthetic. Empirical knowledge is what we know through our physical senses. This is something we can hear, touch, taste, and see. Investigations of these areas are best handled through quantitative methods of discovery. Personal knowledge concerns the inner experience we have. It is the shared human experience and humanistic qualities of knowing. Ethical knowledge requires that we make moment-to-moment decisions about what is right, what should be done, and what is good. This knowledge directs our personal conduct. Aesthetic knowledge is abstract and gives us an appreciation of the deeper meaning of the situation. It takes an inductive approach to knowledge acquisition. These four patterns of knowing make it evident that the nurse who wants to research aesthetic knowing, in particular, will find a qualitative method more appropriate than a quantitative method.

**FAST FACTS in a NUTSHELL**

Barbara Carpers’ four types of knowledge are empirical, personal, ethical, and aesthetic.

**TYPES OF QUALITATIVE RESEARCH**

Although many types of qualitative research can be conducted, only the four main types are discussed here. In qualitative research, the people who are being studied are called “participants” or informants” rather than “subjects,” which is the term more frequently used in quantitative research.

When planning a qualitative study, it is important to consider exactly what you are interested in studying or exploring. Table 5.1 presents a decision path that can provide guidance in choosing the correct type of qualitative research to use. Keep in mind that, for an evidence-based project, you will not conduct an actual research study but rather gather “evidence” to examine your topic of interest.

Qualitative research does not begin with a hypothesis. The researcher does not begin such a study by predicting the results. In a qualitative study, the researcher in effect
becomes the research tool or instrument. To avoid bias, the researcher should be free of preconceived notions (this can be achieved by bracketing, described below) and be “de-centered,” so he or she can become immersed in the situation. To accomplish this, a researcher must clear his or her mind and put personal thinking aside. Otherwise, bias may become part of the study.

One way that a qualitative researcher gathers information is through interviews. While conducting an interview, the researcher may take field notes by using a recording device or taking notes to ensure accurate recall of statements, thoughts, and information gathered. An interview may contain too much information for the researcher to trust to memory. These notes may be written during the interview session if not too distracting for the participant,
or may be written after the interview is completed. Sometimes during the interview, unusual mannerisms are present. It may be important for the researcher to include these mannerisms in his or her field notes. For example, if during an entire interview, the informant is wringing his or her hands and sweating profusely, the researcher should record this in a field note since this might signify nervousness or tenseness.

**FAST FACTS in a NUTSHELL**

- In a qualitative study, the researcher becomes the research tool or instrument.
- A researcher must clear his or her mind and put personal thinking aside.
- Field notes about an interview help the researcher remember the essential facts.

**Phenomenology**

Phenomenology is a method that explores the meaning of human experience through the “lived experience” of the individual. The researcher seeks to use dialogue to explore the meaning that experiences hold for each participant. It examines the “humanness” in life. It is important to note that the participants or informants are asked to describe their experiences as they perceive them. The researcher must separate out his or her own feelings and not impose them on the research participants—a process known as bracketing. This involves the researcher identifying his or her preconceived beliefs and opinions about the phenomenon being studied. In phenomenology, the main data are in-depth conversations, which researchers use to try to understand the participant’s experience of his or her world (Polit & Beck, 2014). A research question based on phenomenology might be worded something like this: “What is the lived experience of women in abusive relationships?”
Writing the Open-Ended Question

In a phenomenological study the research question guides the entire study, so it must be worded correctly, focused, and open ended. The question asks about human experiences in a given situation. This question is not exactly the same as the first question or any question used to initiate the dialogue with the participant. For example, although the research question may be, “What is the lived experience of women in abusive relationships?”, the statement or question that will initiate the dialogue with the participant could be, “Tell me what it is like to live with your husband?” or “What is your relationship like?” It is important to avoid imposing bias into an opening question. Therefore, an inappropriate question would be, “Could you tell me what it is like to live in an abusive relationship?” This particular question assumes and makes a judgment that the relationship is abusive. Although the relationship may be abusive, it is not the researcher’s place to tell or suggest to the participant that the relationship is abusive.

Purposive Sampling

Where does one select the sample for a phenomenological study? The researcher will need to engage in purposive sampling. In this type of sampling, the researcher uses his or her own judgment in selecting people who will be representative of the group the researcher is interested in exploring. For example, a researcher might go to a battered woman’s shelter to study the lived experiences of women in abusive relationships. The researcher would not go to a church recreation
social or a marriage encounter weekend getaway, where the chance of finding participants who are abused might be low. Rather, he or she would go to a place where the population of interest would likely be found.

Sometimes the researcher needs a key informant to begin this process. A key informant is a person who is knowledgeable about the population of interest. This type of research aide is also used in ethnographic studies. The informant might also be able to provide the researcher with access to the designated population. In the preceding example, the key informant might be the director of the woman’s shelter, who has known the women for quite some time. If the director introduces the researcher to the women, the women may open up more readily to the researcher.

The researcher should spend time at the place of interest, in this case a woman’s shelter, so that the participants or informants get to know and learn to trust the researcher. This process is called immersion. The researcher must become immersed in the population of interest to fully gain insight and understanding into what it is like to experience the lived experience being studied. It is hard to understand anything that is being said if, for example, you do not know the language. So, it is important for the researcher to become fully immersed in the population of interest to understand that population.

**FAST FACTS in a NUTSHELL**

To select an appropriate sample:

- Go to a place where the population of interest will likely be found.
- Find a key informant, a person who is knowledgeable about the population of interest.
- Immerse yourself in the population of interest.

**Mode of Data Collection**

Data may be collected in a number of ways. In-depth interviews are usually the primary way in which phenomenological
5. QUALITATIVE RESEARCH

Data are obtained. These interviews may be audiotaped or videotaped depending on the informants’ comfort level. The data acquired must then be transcribed. Because this work is tedious, it is often done by a hired transcriptionist rather than by the researcher. Once the data have been transcribed, similar or common themes are identified. The researcher can accomplish this through the use of note cards or notes, or a computer program designed to make this part of data collection and analysis easier. Commonly used programs include NVivo, NUDIST, and ATLAS.ti.

The researcher continues to collect data until a point of saturation is reached. Saturation occurs when common themes are found and no new information is obtained. In the earlier example, suppose the researcher exploring abused women has interviewed six informants, all of whom tell the researcher the same thing: that their significant others often drink alcohol before abusing them. Based on these responses, it may be safe for the researcher to conclude that drinking was a common theme in precipitating abuse of the women. Once saturation of data has occurred, the researcher can stop the interview process. This methodology helps to explain why fewer informants may be needed in a qualitative study. The researcher keeps interviewing informants until saturation is obtained. Saturation could occur after 5 interviews or after 12 or more interviews. In most phenomenological studies, however, the number of participants is usually low.

Ethnography

Ethnography, ethnographic studies, or ethnonursing studies are qualitative studies that explore the cultural aspects of a particular group of informants. Culture refers to the particular way a group of people lives. It is a pattern of human activity (their values and norms). These studies usually require extensive field work (Polit & Beck, 2014). In the United States, ethnography emerged in the early 20th century in the field of cultural anthropology. Margaret Mead
is one of the well-known proponents of this type of work (Germain, 2001). Ethnography seeks to understand the values, norms, customs, rules, and ways of life that categorize the group of interest. This understanding may take place through the use of interviews, observations, reading documents, examining photographs, videotapes, looking at genograms, or a combination of these approaches. A genogram is a pictorial diagram of a person’s family relationships and medical history.

Before starting an ethnographic study, bracketing is essential to free yourself of predetermined prejudices or biases. In ethnographic research, immersion is both vital and necessary. The best way for the researcher to understand the culture is to live in the culture. Again, the use of a key informant who assists the researcher in gaining access to the particular group of interest is helpful. It is important to note that a culture does not have to represent a nationality. A culture can be any group of individuals with similar beliefs, behaviors, rituals, or patterns of life. For example, a group of mothers who are primary caretakers of children with chronic illnesses can be considered a culture. Nurses can be considered a culture. Also, a culture can contain subcultures. For example, within the culture of the medical profession, nurses, physicians, and nursing assistants or aides can each be considered a subculture. Culture does not necessarily align with one’s race (e.g., Caucasian or African American) or place of origin (e.g., Canadian, Lebanese). It can be but is not limited to that component.

Ethnographic researchers explore phenomena within a culture from the “emic” perspective—an intrinsic or internal perspective. For example, a researcher exploring the emic perspective of Native Americans is doing so from the perspective of the Native American. This means that the resulting study would reflect the point of view of Native Americans in giving reasons for their beliefs and customs.

If the researcher were exploring phenomena from an “etic” perspective, he or she would be examining the life of the Native American from an extrinsic or external perspective. This means that the resulting study would represent
the researcher’s interpretation of the same Native American customs or beliefs. The etic perspective usually takes on a more analytical perspective.

In ethnographic studies, it is important to do fieldwork or live with the informants in their natural environment. This environment could be people’s homes, tribal areas, reservations, huts, or any areas the informant considers home or a place of existing.

Madeleine Leininger has done extensive work in the area of ethnonursing. Her culture care theory was developed in the 1950s and 1960s, and is expressed visually in the sunrise model. Her 1991 book, *Culture Care Diversity and Universality*, offered a breakthrough concept in exploring the nursing care given to individuals who were culturally different from the nurse caregiver. Her work continued with the development of the theory of transcultural nursing, the purpose of which, Leininger (2002) states, was to discover and explain culturally based factors that influence the health, well-being, illness, or death of individuals of a cultural group. Leininger (1978) also proposed a new method known as ethnonursing for nurse researchers to use that includes “the study and analysis of the local or indigenous people’s viewpoints, beliefs, and practices about nursing care phenomena and processes of designated cultures” (p. 15). Leininger defines ethnography as “the systematic process of observing, describing, documenting, and analyzing the life ways or particular patterns of culture (or subculture) to grasp the life ways or patterns of the people in their familiar environment” (p. 35). Ethnography and ethnonursing remain valued areas of interest for many nurse researchers.

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**FAST FACTS in a NUTSHELL**

Madeleine Leininger applied ethnographic research methods to nursing. She proposed the term ethnonursing to describe the study of the nursing practices and beliefs among indigenous people.
Grounded Theory

Grounded theory is a qualitative approach developed by two sociologists, Glaser and Strauss (1967). Using this approach, the researcher studies, collects, and analyzes data before developing a theory grounded in that data (Richards & Morse, 2007). Researchers use grounded theory when they are interested in describing social processes from the perspectives of human interactions or “patterns of action and interaction between and among various types of social units” (Denzin & Lincoln, 1998, p. XX). The goal of grounded theory research is to understand how a group of people defines their reality through social interactions. It uses an inductive (i.e., from the ground up) approach, which relies on everyday behaviors or organizational patterns to generate a theoretical explanation (Munhall, 2001). In this type of study, the researcher uses purposive sampling to look for informants who can shed light on the topic being explored. The emergent theory is based on observations and perceptions of the social scene and evolves during data collection and analysis as a product of the actual research process (Strauss & Corbin, 1994). Data collection is continued until saturation has occurred.

**FAST FACTS in a NUTSHELL**

Grounded theory is an inductive approach to research that uses purposive sampling to find informants who can shed light on the topic of interest.

Historical Research Method

The historical research method is a based on documentation of sources that retrospectively examine events or people (Schmidt & Brown, 2009). This method gains understanding of the past through the collection, organization, and critical appraisal of the facts. One of the main goals of this type
of research is to shed light or a new interpretation on past events. When critiquing this type of study, be aware that the research question may be implied rather than clearly stated. A second important point about historical research is that the more clearly the researcher identifies the historical event being studied, the easier it will be to identify more specific data sources.

In examining the sources of data, it is important to determine whether the data come from primary or secondary sources. **Primary data sources** include eyewitness accounts of the time being studied, which are accounts by those who were actually present (LoBiondo-Wood & Haber, 2006). Other examples of primary sources include oral histories, written records, diaries, government documents, pictures, relics, artifacts, and physical evidence related to the time specified. **Secondary sources** are second-hand or third-hand accounts of historical events or experiences. They are discussions of events written by individuals who did not actually participate in them, but are interpreting or summarizing primary source materials (Polit & Beck, 2012). An example would be an account of an event using an individual's letters (primary sources) as the basis for the interpretation.

Health care researchers who conduct historical research in the United States must be aware that the provisions of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) relating to disclosure of medical information and protection of patient privacy have implications for archival as well as present-day studies. HIPAA has raised new barriers for nurse historians seeking to examine archival resources. Access restrictions vary, and nurse historians may not be able to use photographs or images of previous patients that could be construed as violating patient privacy. Researchers must gain permission to access patient records from the 18th century the same way they do for contemporary records. In such cases, however, a waiver of authorization may often be obtained from the institutional review board (IRB) (Polit & Beck, 2012).
5. QUALITATIVE RESEARCH

OTHER TYPES OF QUALITATIVE STUDIES

Case Studies

Case studies are in-depth examinations of a single entity or a small group of entities. The entity could be a single person, a family, an institution, a community, or another social unit (Polit & Beck, 2014). A case study examining institutions, for example, might look at facilities such as inpatient psychiatric units. In a case study, the entity is placed center stage for examination. When the case study involves a person, the researcher’s focus is to understand why an individual thinks, behaves, or develops in a particular way, often by comparison with his or her status or actions. This type of study usually takes a long time to complete (Polit & Beck, 2014). Researchers using case studies may need to perform multiple in-depth interviews and obtain data from medical records. An example would be an in-depth case study looking at decision making by the parents of an anencephalic infant, who face several decisions, including whether to agree to organ donation, or to remove the infant born without a brainstem from a ventilator.

There are two types of case studies: intrinsic and instrumental. An intrinsic case study is used to develop a better understanding of the case—nothing more or less. The researcher sorts out other curiosities, so that the stories of “those living the case” are teased out (Stake, 2000). An example would be the researcher who is studying incarcerated mothers. In an intrinsic case study, the researcher might interview two women who previously participated in a study about drug usage and were now in jail. The researcher would
ask them about their lives after being arrested and jailed, seeking insight into the women’s experiences. If both women expressed regrets about using drugs and being incarcerated, it could be concluded that these data could guide practice and future research about this issue.

An instrumental case study selects one case study to illustrate an issue of concern (Cresswell, 2007). For example, a researcher who would like to challenge the notion that all patients diagnosed with Down syndrome are mentally challenged and of lower intelligence than the general population might focus on one person whose accomplishments belie that notion. In this type of study, the researcher might look at a case in which a person with Down syndrome was not only holding a job, but working as the manager at a local restaurant chain. With this evidence in an instrumental case study, the data obtained could be used to change not only perceptions, but prejudices, and to guide further research.

Community-Based Participatory Action Research

Community-based participatory action research requires that the community actively participate in all stages of the research process (LoBiondo-Wood & Haber, 2006). After identifying a problem, the researcher, together with the community, explores possible solutions, the method of studying the problem, and the analysis of the data obtained. This is an excellent method for solving community-based problems. It proposes that if the community is involved in the process, members may be more apt to “own the project,” participate in the project, implement the project, and bring the project to completion or an outcome. An example is research on increased violence in a community related to gangs and drugs. The community comes together with the researcher to determine a plan to address the situation, implement the plan, evaluate the plan, and, in the process, solve or eliminate the problem. If the problem has not been solved or eliminated, perhaps information will have been uncovered that can be used to further assess and develop new solutions.
Feminist Research

This type of research approach focuses on gender domination and discrimination within patriarchal societies. The researcher seeks to establish a nonexploitative relationship with his or her informants and to conduct research that transforms these perceived boundaries (Polit & Beck, 2014). An example of feminist research would be decision making engaged in by postpartum women when choosing whether to breastfeed their babies. Is discrimination involved in their decision-making process? Feminist research seeks to uncover and define these real or perceived boundaries of gender.

Narrative Research or Storytelling

One type of research approach that is gaining in popularity is narratives, or storytelling. This type of research allows people to “tell their stories” so that their motivations, desires, and feelings in a multitude of settings are uncovered. As noted by Polit and Beck (2014), narrative analysis focuses on the story as the object of inquiry to see how individuals make sense of their lives or environment and communicate that meaning through the making of narratives or telling stories.

This method can be very effective with children. For example, Godshall (2013) examined pediatric burn patients who were 5 to 10 years of age and had them color a picture of themselves since their burn injury. The children were then asked to “tell the story” of their picture. This method used the picture as a vehicle to encourage the children to talk not only about their burn injury, but also about what they were thinking and feeling and whether they had learned anything from an age-appropriate teaching/coloring book. It can be difficult to interview children and get them to talk, but if they are asked to color and tell a story, they are often more receptive and able to articulate what they otherwise might not have been able to express.
USES OF QUALITATIVE RESEARCH

Qualitative approaches to research inquiry are a viable way to explore or examine situations or problems that are not easily measured by quantifiable methods. This type of research is growing in popularity and offers nurse researchers a method to use in trying to explain more humanistic situations in which the lived experience of individuals may be influenced by variables not identified through quantitative research. The qualitative approaches mentioned in this chapter, along with others, give nurse researchers the ability to study aspects of life and nursing care requiring abstract thought or in-depth examination of how an individual relates to or fits into the overall health care picture. For questions to ask in critiquing a qualitative study, see Table 5.2.

<table>
<thead>
<tr>
<th>TABLE 5.2 Guide to Critiquing Qualitative Research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critiquing Guidelines</strong></td>
</tr>
<tr>
<td><strong>Ask yourself:</strong></td>
</tr>
<tr>
<td>What were the results of the study?</td>
</tr>
<tr>
<td>• Is the phenomenon or topic of interest clearly identified?</td>
</tr>
<tr>
<td>• Does the research approach fit with the purpose or aim of the study?</td>
</tr>
<tr>
<td>• Are the conclusions of the study consistent with the results as reported in the study? (No jumps or reaches for conclusions.)</td>
</tr>
<tr>
<td>Are the results valid?</td>
</tr>
<tr>
<td>• Were the study participants chosen appropriately?</td>
</tr>
<tr>
<td>• Is that consistent with the type of study conducted?</td>
</tr>
<tr>
<td>• Was accuracy and completeness of the study guaranteed?</td>
</tr>
<tr>
<td>• Do the findings fit the data from which they were generated?</td>
</tr>
<tr>
<td>Will the results help me take better care of my patients?</td>
</tr>
<tr>
<td>• Are the findings relevant to people in similar situations?</td>
</tr>
<tr>
<td>• Did the reader learn any new important information?</td>
</tr>
<tr>
<td>• Does the research relate to or change practice?</td>
</tr>
</tbody>
</table>

(continued)
### TABLE 5.2 Guide to Critiquing Qualitative Research (continued)

<table>
<thead>
<tr>
<th>More Specific Questions</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the researcher indicate the type of study approach?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Are the language and concepts consistent with the study approach?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Are the data collection and data analysis consistent with the study approach?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the significance/importance of the study clear?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Does the review of the literature support the need for a study?</td>
<td></td>
<td></td>
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<tr>
<td>• Does the study make a difference to current practice?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Are the background and significance of the study defined?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Are the implications for future research specified?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the sampling method clear and appropriate for the type of study?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Does the researcher indicate the sample size and demographics?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Does the researcher control the selection of the sample?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is the type of sample appropriate for the type of study?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Is the number of sample participants appropriate for the type of study?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the way the data was collected clear?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Are the sources and methods of verifying data clear?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Are the researcher’s roles and actual involvement clearly explained?</td>
<td></td>
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</tbody>
</table>

Adapted from Melnyk and Fineout-Overholt (2010).

**FAST FACTS in a NUTSHELL**

The four patterns of knowing articulated by Carper are empirical knowledge, personal knowledge, ethical knowledge, and aesthetic knowledge. The four main types of qualitative research are phenomenology, ethnography, grounded theory, and historical research.
Case studies, narratives or storytelling, feminist research, and community-based participatory action research are other types. The people in a qualitative study are called participants, whereas those in a quantitative study are called subjects. Saturation occurs when all participants in a study are giving the same responses; this is the point at which no new data will be forthcoming. Madeleine Leininger (1991) developed the sunrise model using transcultural nursing, which seeks to discover and explain culturally based factors that influence health, well-being, illness, or death of individuals of a cultural group. Sources of data may be primary or secondary. Primary sources include eyewitness accounts of the event being examined, whereas secondary sources are written by people who heard or read about the event or occurrence from a primary source. Primary sources are much more desirable as accurate accounts of basic information.
The two basic formats for articles used for your research evidence are print and electronic. Print sources remain available at most libraries, but much information is now available electronically and is therefore readily accessible to anyone with access to the Internet.

In this chapter, you will learn:

1. The differences between primary, secondary, and tertiary sources
2. How to explore print and electronic sources
3. The basic databases and search engines available when searching for evidence
4. How to conduct a basic literature search

PRIMARY, SECONDARY, AND TERTIARY SOURCES

Primary and secondary data sources were introduced in Chapter 5 in the context of qualitative research studies. When conducting research in any field, a primary source
is one written by the person or people who conducted the research study or wrote about the topic of interest. It is the original source of the information. Secondary sources are a description of a study or article written by someone else. A secondary source uses information or data from a primary source by describing, summarizing, analyzing, or interpreting the primary source information. For example, a textbook written about nursing education is a primary source. If a person writes a textbook about nursing education and summarizes or describes the information provided in the original textbook, this second textbook is a secondary source. There are also tertiary sources. If the textbook includes other secondary sources explaining nursing education, it then becomes a tertiary source. It is preferable when searching for evidence to use only primary sources.

PRINT SOURCES

How does one begin to research an evidence-based practice project? The print sources can be found in the library using indexes, which contain references to articles in periodicals that have been published over a period of years. These print indexes can be used to locate journal articles related to the topic of interest.

Cumulative Index to Nursing and Allied Health Literature (CINAHL)

The Cumulative Index to Nursing and Allied Health Literature (CINAHL) has been published continuously since 1961. Until 1977, the title was the Cumulative Index to Nursing Literature. CINAHL now includes nursing and allied health journals, including dental hygiene, nutrition, occupational therapy, physical therapy, physician’s assistant, and respiratory therapy journals. This print index is a bound text found in the periodical section of the library. Do not hesitate to ask the librarian for assistance. Most libraries have
research assistants available to help novice researchers. CINAHL is also available online in an electronic database that now is owned and operated by EBSCO Publishing. Information about CINAHL is available at https://health.ebsco.com/products/the-cinahl-database. A subscription to this database is required, so it is easiest to access through an educational institution or workplace that maintains a subscription. Sometimes, you are able to print full-text articles. In other cases, you will only be able to obtain a reference and an abstract of the article. This varies depending on the type of subscription purchased. Most often references and abstracts are free to the general public without a subscription.

Nursing Studies Index (NSI)

The Nursing Studies Index was compiled at the Yale University School of Nursing under the direction of Virginia Henderson. This index is an annotated guide to English-language reports of studies and historical and bibliographical materials about nursing. The four available volumes, published from 1963 to 1972, cover the years 1900 to 1959. This is an important resource for studies conducted during the first 60 years of the 20th century.

Index Medicus

This is the best-known index of medical literature. First published in 1879, the last printed volume appeared in December 2004. Since 1977, this database has been available for free on the Internet through MEDLINE.

Abstracts

An abstract is a brief summary of an article’s contents that describes its purpose, methods, major findings, and conclusions. By reading an abstract, the researcher should be able
to understand the highlights of the article and determine if it is related to the topic of interest. The abstract, which is usually the first paragraph beneath the title, is identifiable by its appearance; it is usually indented or printed in boldface or italic type. The abstract may be written as one summary paragraph but usually includes subheadings that highlight the research problem or issue addressed, the type of research method used, the results or findings of the study, and the main conclusions or recommendations from the study.

This style of abstract is the basic one you will find provided for a research article. Other styles of abstracts that you may encounter during your search include psychological abstracts, dissertation abstracts, and master’s thesis abstracts.

**FAST FACTS in a NUTSHELL**

A database is a collection of data or information stored in a computer system. Think of it as an electronic filing system.

**ELECTRONIC SOURCES**

Electronic sources have become the preferred method of accessing research articles and literature. The use of electronic communication has changed the way data are searched for and obtained. Most people today access the world of electronic databases through home computers or personal electronic devices. Schools, universities, and medical institutions also provide access to electronic databases.

**Databases**

The key to finding data or articles pertinent to your study is to access the appropriate database. There are many to choose from. Some are free, and some must be purchased by universities or medical institutions. For example, MEDLINE can be accessed for free through the National Library of
Medicine’s PubMed search system. A full bibliographical source is given. Many of the articles thus retrieved are free, but some publishers may charge a fee to purchase a full-text article. See Table 6.1 for examples and descriptions of some common searchable databases.

**Bibliographical Sources**

A bibliographical source, whether printed or on the web, simply provides you with a complete reference that you can use to locate the full-text article.

**Abstracts**

As previously noted, an abstract is simply a concise summary of a research article that is designed to help the reader quickly grasp the key elements of the article. Some databases on the web provide free abstracts. Others require you to purchase that information. See Table 6.1 for more information.

Other full-text databases in which you may be interested are:

- **AMED**: The Allied and Complementary Medicine Database is a bibliographical database produced by the Health Care Information Service of the British Library. It includes journals about complementary medicine and palliative care and can be accessed through EBSCO (see Table 6.1).

- **ClinicalTrials.gov**: This site is provided by the National Institutes of Health. It is a registry and results database of publicly and privately supported clinical studies conducted around the world. It can be found at www.clinicaltrials.gov/

- **MD Consult**: This database, provided by Elsevier Company, includes full-text articles from over 80 medical journals and 50 medical references across a wide range of specialties. It contains clinically relevant drug information and more than 15,000 patient handouts that can be used for patient education. It is available at www.sciencedirect.com/mdc/
### TABLE 6.1 Examples of Databases

<table>
<thead>
<tr>
<th>Database</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINAHL (Cumulative Index of Nursing and Allied Health Literature) (1982–present)</td>
<td>Premier site for nursing and allied health; also includes nutrition, physical therapy, occupational therapy, dentistry, and respiratory therapy journals</td>
</tr>
<tr>
<td>* Material from more than 3,000 journals</td>
<td></td>
</tr>
<tr>
<td>* Full-text is available for more than 300 journals, but must be purchased</td>
<td></td>
</tr>
<tr>
<td>* Abstracts and bibliographical references are also available</td>
<td></td>
</tr>
<tr>
<td>* Owned and operated by EBSCO Publishing</td>
<td></td>
</tr>
<tr>
<td>EBSCO host, an international information system that provides e-journals, e-book, and print subscriptions, as well as e-resource and management tools, full-text and secondary databases, and related services</td>
<td>Provides clinical patient oriented, administrative databases with the latest bedside evidence, nursing resources, education materials, marketing tools, medical research databases, social work information, and the ability for CME and CEU opportunities</td>
</tr>
<tr>
<td>* More than 300 full-text or secondary databases are available</td>
<td></td>
</tr>
<tr>
<td>* Includes bibliographical citations, abstracts, full-text articles, and provides other references where the article is cited</td>
<td></td>
</tr>
<tr>
<td>* Multilanguage health databases are available</td>
<td></td>
</tr>
<tr>
<td>* Free trials are available, but must be purchased</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 6.1 Examples of Databases (continued)

<table>
<thead>
<tr>
<th>Database</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVID, operated by the Wolters Kluwer Health publishing company is internationally supported</td>
<td>Key subject areas include agricultural and food sciences, bioengineering and biotechnology, clinical medicine, computer science and technology, dentistry, earth, and environmental sciences, evidence based medicine, geology and life sciences, neurology and neurosciences, nursing and allied health, pharmacy, philosophy and religion, physics, psychology and psychiatry, social sciences and the humanities, technical science, veterinary medicine, and zoology</td>
</tr>
<tr>
<td>• Includes full bibliographical references, abstracts, full-text links, authors full name reference, other articles citing the article found</td>
<td>Includes primarily general science and chemistry journals, for which the life sciences articles are indexed for MEDLINE and some online books</td>
</tr>
<tr>
<td>• A paid subscription is needed to use this database</td>
<td></td>
</tr>
<tr>
<td>• Search aids are suggested on the screen</td>
<td></td>
</tr>
<tr>
<td>• Education support and tutorials are available free of charge</td>
<td></td>
</tr>
<tr>
<td>• Available in multiple languages</td>
<td></td>
</tr>
<tr>
<td>PubMed was developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM), located at the U.S. National Institutes of Health (NIH)</td>
<td></td>
</tr>
<tr>
<td>• Publishers participating in PubMed electronically submit citations to NCBI before or at the time of publication</td>
<td></td>
</tr>
<tr>
<td>• If the publisher has a website that offers full text of its journals, PubMed provides links to that site as well as biological resources, consumer health information, research tools, and more; however, there may be a charge to access the text or information</td>
<td></td>
</tr>
<tr>
<td>MEDLINE (Medical Literature Analysis and Retrieval System Online) (1966–present)</td>
<td>Studies in medicine, nursing, dentistry, psychiatry, veterinary medicine, and pharmacy</td>
</tr>
<tr>
<td>• Includes article full citation</td>
<td></td>
</tr>
<tr>
<td>• Provides links to many (but not all) full-text articles and other related resources</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 6.1 Examples of Databases (continued)

<table>
<thead>
<tr>
<th>Database</th>
<th>Description</th>
</tr>
</thead>
</table>
| MEDLINE (continued) | - The largest component of PubMed  
- A free accessible online database of biomedical journal citations and abstracts created by the U.S. National Library of Medicine (NLM)  
- Contains more than 5,200 journals published in the United States and more than 80 other countries that are currently indexed for MEDLINE  
- Available from the NLM homepage and can be searched for free at www.nlm.nih.gov |
| ERIC (Education Resources Information Center Institute of Education Sciences) (1966–present), an index of education journals | - Contains more than 1.3 million bibliographical records of journal articles; most are peer reviewed  
- Abstracts and links to full text in .pdf format are available from individuals and publishers who give free full text; websites and libraries that may have full text are provided  
- For most materials from 2004 forward, if full text is not available in ERIC, links to publishers are provided  
- Contains journal articles, books, research synthesis, conference papers, technical reports, policy papers, and other education related materials  
- Studies from the world of education; ERIC indexes materials from scholarly organizations, professional associations, research centers, policy organizations, university presses, the U.S. Department of Education, and other federal, state, and local agencies; individual contributors submit conference, proceedings, papers, research papers, dissertations, and theses |
| PsycINFO (corresponds to the print Psychological Abstracts) (1887–present) | - Abstract database Prepared by the American Psychological Association (APA)  
- Studies from psychology and related disciplines; usually accessed through a vendor like OVID or APA |

(continued)
TABLE 6.1 Examples of Databases (continued)

<table>
<thead>
<tr>
<th>Database</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PsycINFO (continued)</td>
<td></td>
</tr>
<tr>
<td>• Contains more than 2 million records selected from more than 2,000 journals</td>
<td></td>
</tr>
<tr>
<td>• Also contains bibliographical citations, abstracts, cited references, and descriptive information across a wide variety of scholarly publications in the behavioral and social sciences</td>
<td></td>
</tr>
<tr>
<td>• Available at <a href="http://www.apa.org/psycinfo/">www.apa.org/psycinfo/</a></td>
<td></td>
</tr>
<tr>
<td>Cochrane Database of Systematic Reviews</td>
<td>Full text of systematic reviews prepared by the Cochrane Collaboration, including completed reviews and protocols</td>
</tr>
<tr>
<td>• Excellent source for “evidence” in evidence-based practice</td>
<td></td>
</tr>
<tr>
<td>• Includes full text of reviews</td>
<td></td>
</tr>
<tr>
<td>• Abstracts of review are available</td>
<td></td>
</tr>
<tr>
<td>at <a href="http://community.cochrane.org/editorial-and-publishing-policy-resource/cochrane-database-systematic-reviews-cdsr">http://community.cochrane.org/editorial-and-publishing-policy-resource/cochrane-database-systematic-reviews-cdsr</a></td>
<td></td>
</tr>
</tbody>
</table>

Full-Text Databases

When searching for research articles look for sources that offer the full text of each article, including graphs, charts, and other illustrations. Vendors such as OVID include hyperlinks to references of full-text articles. The full-text article may be available in .pdf or .html format. Fewer vendors offer access to full-text medical books. Although online access to full-text medical books is growing, such access is still quite limited for nursing and allied health books.

A hyperlink lets you click on a web address that automatically connects (or links) you to relevant material. Hyperlinks usually appear in bold type, underlined, or in a different color from the rest of the text.
Key Word Search

Most electronic databases require that you begin a search by identifying key words. Key words are terms that describe your subject of interest. For example, when searching for information about incarcerated women with human immunodeficiency virus (HIV), you could use the key words “incarcerated women,” “HIV in prison,” “HIV in prisoners,” “prisoners with HIV,” or “AIDS in women.” Trying each of these key words will demonstrate how the manipulation of a few words can yield different lists of research articles.

Search Engines

A search engine is an information retrieval system stored on a computer system, such as the World Wide Web. One of the most popular engines is Google, which was started in 1998.

Other search engines include:

- Bing
- AOL search
- Dogpile.com
- Excite
- Yahoo search
- MSN search
- Ask.com (formerly Askjeeves.com)
- InfoSpace

The key to finding scholarly research articles is to use a search engine that yields reliable information. One free source that fits this requirement is Google Scholar (www.googlescholar.com), which can be used to locate nursing research articles. It also indexes other resources that are not part of scholarly studies, such as:

- Commercial sites
- Individual home pages
• Advocacy sites
• Cheaters’ sites

Remember that unlike scientific and scholarly literature and databases, Google is unfiltered, so the user should be very careful to evaluate the results provided through its searches. See Table 6.2 for the pros and cons of using Google Scholar. If you choose to use Google Scholar, you will find the following sources:

• Journal articles and abstracts from:
  ▪ Publishers’ websites (e.g., JSTOR, Muse, Wiley)
  ▪ Free online databases (e.g., PubMed, ERIC)
  ▪ Online journal sites (both free and subscription based)
• Peer-reviewed papers
• Selected books from:
  ▪ Google book search
  ▪ Open WorldCat

Google Scholar is not currently a comprehensive source for serious research, but it continues to grow and improve (see Table 6.2). Many students use it because it provides free access, and nurse scholars and other researchers increasingly are citing it. Occasionally, Google Scholar covers the nursing literature better than traditional databases. So, indeed, use it as a search engine if you want to be comprehensive, but use it in addition to CINAHL, MEDLINE, and other more traditional health information search engines. It may be helpful for topics that cross disciplinary boundaries.

<table>
<thead>
<tr>
<th>TABLE 6.2 Pros and Cons of Google Scholar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pros</strong></td>
</tr>
<tr>
<td>Cross disciplinary</td>
</tr>
<tr>
<td>Subjects don’t neatly fit into one category</td>
</tr>
<tr>
<td>Includes both book and journal literature</td>
</tr>
<tr>
<td>Cited reference searching</td>
</tr>
<tr>
<td>Citation checking</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
CONDUCTING A BASIC LITERATURE SEARCH

Starting the Search

Now that you have accessed a database, how do you conduct the actual search? It is important to understand some terms that will assist in the search. To start a search on pediatric burn care, for example, access the computer’s search engine and enter the word *burns* in the search box as your **key word**, the word you choose for your search that describes your topic of interest.

**FAST FACTS in a NUTSHELL**

Remember that certain diseases can be known by different terms, so you need to search all of them to get a complete list of the relevant literature.

**Example:** **SUBJECT HEADING:** CEREBRAL VASCULAR ACCIDENT

Can also be known as:
- stroke
- CVA
- cerebrovascular accident
- cerebral vascular accidents
- cerebrovascular accidents
- CVAs
- strokes

The CINAHL database is used in this instructional example. You can access this database on your computer at https://health.ebsco.com/products/cinahl-plus-with-full-text and follow along with the search below.

**The Initial Search**

After entering the term *burns* into the search window, the resulting search yields **8,170** journal articles. It is clear by
this large number of articles that this search term was too broad. The next step is to refine the search by combining two key words from your topic of interest: pediatrics and burns. By inserting the word *and* as your operator between the key terms, the two terms will be connected, and the search will be more clearly defined. (The words *and*, *or*, and *not* are known as Boolean search operators; their use in refining searches is described later in this chapter.) Entering the refined search term *burns and pediatrics* now yields articles that contain both terms. The results have now identified 91 journal articles related to *burns and pediatrics*.

**Stop Word**

A stop word is a word that a search engine ignores when you conduct a query because the word is so common that it does not contribute to the relevancy of the search. Examples of these words are *and*, *get*, *the*, and *you* (Joos, Nelson, & Smith, 2014).

**Narrowing the Search**

Narrowing the search by using two key words produced results that more exactly apply to the topic in which you are interested. The search has narrowed the results to 91 articles that relate specifically to pediatric burns.

To narrow the search even further, you can put quotation marks (“/”) around the words used as your key terms. Doing this will yield only titles that contain both your key search words. See below for more about using quotation marks when searching, or add more key words to refine your search even further.

Note that conducting a search using key word(s) is just one of many approaches. Searches also can be conducted using author name, article title, or journal title. Other options include basic searches, advanced searches, and searches that look for a specific citation in the text of an article. Simply select the method you want to use in conducting the search.
It is preferable to obtain articles that have full text so you will be able to read them. To determine which articles are available as full-text articles, either:

1. Scroll through all the results to look for those identified as “full-text” articles, or
2. When conducting the search, click “linked full text” in the “limit your results” box on the right side of the screen.

Narrowing the search using a timeline is also possible. The CINAHL database includes a timeline in the box on the side of the screen showing the years for which journal articles are available. To refine the search to reflect certain years, click “update results.”

After updating, the search results list only seven articles that have full text. These full-text articles are available as .pdf files, .html files, or linked files. Click on the desired text format to obtain the full text of the selected journal article. Also note that the timeline has also narrowed to the years 1999 to 2007 from the broader timeline previously displayed.

Expanding the Search

**Truncation**

If, in contrast to the preceding example, the search using a key word only produced one hit, or result, the search would need to be expanded. To expand a search, you can enter the key word and then use the term *or* and truncation to increase your results. **Truncation is a technique that is used to find variant word endings**, as illustrated in the examples that follow:

<table>
<thead>
<tr>
<th>Key Term</th>
<th>= Truncations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child*</td>
<td>child, children, children</td>
</tr>
<tr>
<td>Parent*</td>
<td>parent, parents, parenting</td>
</tr>
<tr>
<td>Spouse*</td>
<td>spouse, spouses, spousal</td>
</tr>
</tbody>
</table>
The truncation symbol varies by search engine, with *, !, ?, $, and # commonly used. For example:

<table>
<thead>
<tr>
<th>Search Engine</th>
<th>Truncation Symbol to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBSCO host (CINAHL), ProQuest, others</td>
<td>*</td>
</tr>
<tr>
<td>OVID and MEDLINE</td>
<td>$</td>
</tr>
<tr>
<td>Google, Yahoo</td>
<td>automatic</td>
</tr>
</tbody>
</table>

To expand your search using the CINAHL database truncation symbol (*), enter the word followed by the symbol, as follows: *burns*. This will expand the search to include any articles that contain the word *burns* anywhere in the citation. Note that using the search term *burns* could produce articles written by an author named Burns, articles that include the word *burns* in the title of the article, or articles that simply mention burns once in the text.

Be aware that different key words can generate dramatically different results. For example, if the word *children* is substituted for the word *pediatrics*, the search yields only two results, and they are not even full-text articles. Do not become frustrated when this occurs. Conducting a search takes time. Be creative, “free think,” and search using a variety of terms to experience how different search results can be.

### Use of Other Terms to Expand or Narrow Your Search

**Boolean Search Operators**

Boolean logic defines logical relationships between terms in a search (Figure 6.1). The Boolean search operators are **and**, **or**, and **not**. When executing a search, **and** takes precedence over **or**.

- **And** combines search terms so that the text of each search result contains all of the terms. For example, *burns and pediatrics* finds articles that contain *both* burns and pediatrics
6. FINDING THE EVIDENCE

Figure 6.1 Understanding Boolean search strategies. Adapted from Joos et al. (2014).

- **Or** combines search terms so that each search result contains at least one of the terms. For example, *burn or pediatrics* finds results that contain *either* burn or pediatrics.
- **Not** excludes terms so that each search result does not contain any of the terms that follow it. For example, *television not cable* finds results that contain television but *not* cable (EBSCO Support, 2015).

**Explode**

You can also click to expand the subject heading, referred to as “exploding the heading.” The headings are exploded, or expanded, to retrieve all references indexed to that term as well as all references indexed to any narrower subject terms. In this
example, only “burns, inhalation” can be exploded. To explode these terms, check the box “explode” and click on smoke inhalation. In a database with a “tree” format, such as MeSH or CINAHL, exploding retrieves all documents containing any of the subject terms below the term you selected. In other databases, exploding retrieves all documents containing the selected term, as well as any of its first level of narrower terms. If a plus sign (+) appears next to a narrower or related term, there are narrower terms below it. Scan the list for a relevant term and click in its checkbox. Then click “continue.” You will then find articles related to those subheadings.

**Major Concept**

If you want to search by major subject heading, select “major concept.” This creates a search that finds only records for which the subject heading is a major point of the article. Searches are limited with specific qualifiers (subheadings) to improve the precision of the search. Major subject headings indicate the main concept of an article. Note that you can use both explode and major concept at the same time to retrieve references indexed to your term (and its narrower terms) and all articles for which the subject heading is the major point of the article (EBSCO Support, 2015).

**Scope Notes**

In some databases (e.g., CINAHL, MEDLINE), you can click on the word “scope” or the scope icon. This enables you to view the entire scope note, which is an explanation of a term and its synonyms.

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**FAST FACTS in a NUTSHELL**

To focus your search on specific terms, try putting quotation marks (“/””) around the word(s).
Using Quotation Marks When Searching

To narrow your search when using a database or search engine, place quotation marks around the terms for your search. The search will then yield only results that contain all of the words in your search term or phrase. If quotation marks are not used, the results will include references containing any of the words. Narrowing the search to the exact terms will make the search more successful in producing articles that reflect the topic of your research.

For example, suppose you enter the search term “adult day cares” as shown here, using quotation marks. The following article will appear. Note that the citation contains all three words.

1. Adult day cares and public policy: a strategic plan for the Louisville metropolitan area. Wishnia GS; Kentucky Nurse, 1997 Oct-Dec; 45 (4): 5

If you enter adult day cares without quotation marks, your search also will yield articles with any one of the words in them, as seen in the following three listings.


2. Fostering the transition from pediatric to adult neurosurgical care. Abraham S; AXON/ L’AXONE, 2007 Winter; 28 (2): 13

3. What kills one woman every minute of every day? Kantrowitz B; Newsweek, 2007 Jul 2–9; 150 (2): 56, 57

Searching by Publication or Journal

If the search produces a reference or citation to a journal article that you would like to use, locate the journal in a database by searching for the name of the publication or journal. To do this, click on the publication tab and search alphabetically by the first letter of the name of the journal to see if the database has your journal.
COMMON DATABASES

EBSCOhost

EBSCOhost is an online source for the e-journals available at your library. With EBSCOhost, you can:

- **Find a specific journal** quickly by using the Find Journals feature.
- **Browse through a list of all journals** available with the Browse feature.
- **Browse a list of subject categories**, then view a list of all journals that fall in a category of interest. This allows you to easily find journals that cover specific topics.
- **Find specific articles** quickly using the Find Articles feature. Search by article title or by the author’s name.
- **Find articles that cover a specific topic** by searching for key words in the titles, abstracts, and even full text of millions of articles.
- **Read article abstracts** and link directly to full text of the articles you find.

An example of a citation you may find in EBSCOhost is:

*Hepatitis A seroprevalence and risk factors among day-care educators.* (includes abstract) Muecke CJ; Clinical & Investigative Medicine, 2004 Oct; 27 (5): 259–64 (journal article research, tables/charts) PMID: 15559862 CINAHL AN: 2005114261

You can then click on “PDF Full Text” and receive the full text article in a .pdf format. Or, you can opt to receive the full text article in an .html file. Clicking on the linked “full-text” tab will hyperlink you to a site where you can access full text or may automatically download the full text format for you.

OVID Online

OVID, operated by Wolters Kluwer Health, provides information for professionals and students in medicine,
nursing, allied health, pharmacy and the pharmaceutical industry. It consists of hundreds of databases, including more than 1,200 journals and books from dozens of publishers. OVID offers training programs to assist users with their searches. More information about OVID can be found in Table 6.1 and online at www.ovid.com/site/ (Wolters-Kluwer Health, 2009). Another online tutorial for OVID is available at http://calder.med.miami.edu/pointis/ovidsearch.html.

**Using the OVID Database**

As with any search, you need to begin with a search term. In the example below, *geriatrics* is the search term. A search using this term would yield the following response, indicating that 5,456 results have been matched to your term:

*Results of your search: geriatrics.mp. [mp=title, abstract, full text, caption text]*

*Viewing 1–10 of 5456 Results*

That is a lot of articles to look through. Listed as number 14, below, is one result, with its reference information. Somewhere in this article geriatrics is mentioned. As you can see, this search yield results that are quite broad and may not be exactly what you are looking for.


So, you might want to refine your search by adding another search term. Perhaps “geriatrics and stroke” might yield more specific results. To the right of the citation on the OVID screen is a list of options:

- Complete Reference
- Table of Contents
- OVID Full Text
- Full Text
- Abstract
Click on the one that best fulfills your needs. Complete Reference will give you just that—a complete reference of the article. Table of Contents will give you the contents of a book or periodical. OVID Full Text will give you the full text with the journal name at the top of the article. Full Text will give you the full text of the article with the database name on the top of it. If you want just the reference, click on that to receive the specific information you want.

PubMed

PubMed Central (PMC) is the free digital archive of biomedical and life sciences journal literature at the U.S. National Institutes of Health’s National Library of Medicine (NIH/NLM). It includes more than 24 million citations from MEDLINE and other life science and biomedical journal articles back to the 1950s. PubMed provides links to full-text articles and other related resources, as well as online books. All the articles in PMC are free (sometimes on a delayed basis), as is access to available abstracts. More information about PubMed can be found at www.ncbi.nlm.nih.gov/pmc/.

Journals and Magazines

When you are searching for journal articles, be sure to use only research articles published in scholarly journals. Keep in mind that articles in magazines and some journals may not be written by a researcher or even by an expert in the field or a member of the medical profession. In such cases, you are actually reading someone else’s opinion about the research; this is sometimes, but not always, presented in an editorial format. Therefore, it is important to look at both the author and the source of the information you are using. You want to read research articles written by a researcher or an expert in your area of interest. Table 6.3 lists several differences between magazines and scholarly journals.
6. FINDING THE EVIDENCE

It is also important to pay attention to the type of journal. The field of nursing has many nursing journals, available online or in print format. For many specialties, such as pediatrics, you will find many relevant journals whose articles are written by physicians, nurses, scientists, editors, and other professionals. Look at the journal to see if it offers research findings or just informational articles about a particular disease process or clinical application. Although these may be very important, they do not lead to compelling evidence in EBP. If you recall the hierarchy of strong evidence, research from randomized controlled trials is the strongest evidence.

<table>
<thead>
<tr>
<th>TABLE 6.3 Differences Between Magazines and Scholarly Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Magazines</strong></td>
</tr>
<tr>
<td>Author</td>
</tr>
<tr>
<td>Notes</td>
</tr>
<tr>
<td>Style</td>
</tr>
<tr>
<td>Editing</td>
</tr>
<tr>
<td>Audience</td>
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<tr>
<td>AS</td>
</tr>
<tr>
<td>Look</td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Contents</td>
</tr>
<tr>
<td>Indexes</td>
</tr>
</tbody>
</table>

Adapted from http://lib.mnsu.edu/research/documents/scholarly.pdf.
You will not find that in journals that offer information-type articles. So you will need to look to a scholarly journal that includes only peer-reviewed articles. More information about this type of journal is provided below and in Table 6.3.

Online Journals

A large number of journals are now available online. These journals may be referred to as e-journals or e-zines. At www.nursingcenter.com, operated by Wolters Kluwer Health, you can view the contents of the most current issue of more than 50 leading journals. You can also go directly to each journal’s home web page, where you can usually view the most current issue of the journal. If you are looking for a pediatric journal, for example, you can enter pediatric nursing journals into any search engine, such as Google, and a multitude of journals will pop up. If you are interested in geriatric journals, you can enter geriatrics and similar results for geriatric journal sites will appear. Table 6.4 lists some of the nursing journals that can be accessed for free online.

Evidence-Based Practice Center

Another great place to search, especially if you are looking for evidence beyond that provided through the Cochrane

<table>
<thead>
<tr>
<th>TABLE 6.4 Free Online Nursing Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal</td>
</tr>
<tr>
<td>Allnurses.com (web journal about critical care and emergency nursing)</td>
</tr>
<tr>
<td>Imprint (magazine for nursing students) from the National Student Nurses Association (NSA)</td>
</tr>
<tr>
<td>Internet Scientific Publications</td>
</tr>
<tr>
<td>Nursing World</td>
</tr>
<tr>
<td>Online Journal of Issues in Nursing</td>
</tr>
<tr>
<td>Online Journal of Nursing Informatics</td>
</tr>
</tbody>
</table>
Collaboration, is the Agency for Healthcare Research and Quality (AHRQ). Its Evidence-Based Practice Center (EPC) provides reports that are used for informing and developing coverage decisions, quality measures, educational materials and tools, guidelines, and research agendas. For more information on the EPC, including a list of archived reports, visit the AHRQ website (www.guideline.gov/resources/ahrq-evidence-reports.aspx). In addition, if you do an Internet search for evidence-based practice guidelines, you will find that many disciplines, such as orthopedics, have websites that are designated to best practice in their particular specialty area.

Scholarly Journals and Peer-Reviewed Journals or Articles

Scholarly Journals

A scholarly journal contains articles written by scholars, researchers, professors, or experts in the field on topics related to that journal. The journal has a review process in place and less emphasis is placed on advertising. It usually includes research articles that are of interest to other professionals in that field (see Table 6.3).

Peer-Reviewed Articles

If an article is peer reviewed, it means that it has been read and approved for publication by experts in the field of the research topic. Usually, more than one reviewer’s approval is required for publication. The review process is usually blinded, which means that the reviewers do not know the name of the author, so that personal relationships do not enter the process. All identifying author criteria and credentials are omitted from the article prior to the review process.

Table 6.5 lists a sampling of scholarly journals that you might want to consult in your search for research journals appropriate to your topic of interest.
Gray Literature

Gray literature (also called grey literature) includes works that may not have been formally peer reviewed and may not have appeared in standard or recognized journals, publications or databases. Government agencies, universities, corporations, associations and societies, research centers, and professional organizations produce this type of literature. For example some nursing e-magazines (not electronic versions of journals, but informal local nursing magazines, or conference proceedings or government documents). These do not have a wide distribution, but do appear on the Internet within the domain of health care information (Joos et al., 2014).

**TABLE 6.5 Scholarly Nursing Journals for Research**

<table>
<thead>
<tr>
<th>Journal</th>
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<tbody>
<tr>
<td>Advances in Nursing Science</td>
</tr>
<tr>
<td>Canadian Journal of Nursing Research</td>
</tr>
<tr>
<td>Clinical Nursing Research</td>
</tr>
<tr>
<td>Dimensions of Critical Care Nursing</td>
</tr>
<tr>
<td>Evidence-Based Nursing</td>
</tr>
<tr>
<td>Journal of Advanced Nursing</td>
</tr>
<tr>
<td>Journal of Nursing Research</td>
</tr>
<tr>
<td>Journal of Nursing Scholarship</td>
</tr>
<tr>
<td>Nursing Research</td>
</tr>
<tr>
<td>Nursing Science Quarterly</td>
</tr>
<tr>
<td>Western Journal of Nursing Research</td>
</tr>
</tbody>
</table>

**FAST FACTS in a NUTSHELL**

Now that you have found a research article, how do you know it is a good one? Remember the principles you learned in Chapters 4 and 5 as part of quantitative and qualitative research design. Make sure the articles are relevant and follow the sound principles of research. Evaluate the evidence. We explore this step in the next chapter.
Now that you have found your research article how do you know if it is a good article or a flawed one? When doing an evidence-based practice (EBP) project, it is very important that you use reliable evidence. You would not want to recommend a change to a clinical practice based on evidence that is not “good” or on the basis of one study. This chapter discusses how to evaluate the evidence that you have found in order to design your EBP proposal.

In this chapter, you will learn:

1. How to evaluate the evidence you found asking five key questions
2. To critique research articles using a simple worksheet provided in the chapter appendix
3. To understand the rating hierarchy of the evidence

EVALUATING THE EVIDENCE

Now that you have found evidence, you need to determine if the evidence is good enough to warrant a recommendation to suggest a change in practice. It is essential that the evidence
be carefully scrutinized. You would not want to propose a change in practice based on flawed or biased information.

To determine if a study is relevant to your EBP project, you will need practice in analyzing the research. You may want to consult a research text for a more detailed understanding of this process. In this chapter, we briefly discuss how to analyze evidence. Remember that just because a research study is published in a peer-reviewed journal does not ensure that it was well designed or well conducted. It does not guarantee that data were accurately analyzed or accurately reported in the publication. You need to think about how the study was designed, how the research was carried out, and how the data were analyzed. If a tool was used in the study, was it tested prior to use and proven both reliable and valid? Some general questions you may want to ask when examining studies are listed in Table 7.1. Also review Tables 4.2 and 5.2, earlier, which offer guides to critiquing quantitative and qualitative research. Figure 7.1 provides a schematic illustration of an evidence hierarchy that can assist you in determining the levels of evidence or the strength of the evidence in a study.

**FAST FACTS in a NUTSHELL**

Never suggest or recommend changing practice on the basis of one research study. Many novices who embark on an EBP project are so happy to find one study on their topic of interest that they base their entire project on it. This should never be done.

As you begin to analyze the evidence for your EBP project, you need to ask yourself five key questions about the research study you are evaluating:

1. What were the results of the study?
2. Are the results valid?
3. Are the results reliable?
4. Will the results help me provide improved care for my patients?
5. Do the results make sense for my patient population?

Let’s take a look at each of these questions more closely.
TABLE 7.1  Some Basic Questions to Ask When Evaluating Research Evidence

- Is the research study relevant or important to nursing?
- Is the abstract present, and does it include the purpose, method, and summary of findings of the study?
- Was a theoretical or philosophical framework used for the study?
- Is there a hypothesis?
- How many subjects (or participants) were there?
- Was the number of subjects (or participants) relevant for the type of study done?
- How were the subjects (or participants) selected?
- What method of data collection was used?
- Was the data collection method sound and accurate?
- Did the data collection method provide reliable and valid results?
- How were the data analyzed, and was this method appropriate for the study?
- Are any assumptions for the study included?
- Are limitations of the study included?
- Are suggestions for future research included?
- Is there a discussion of the results?
- Is any bias revealed in the data?
- Is there any researcher bias? For example, was the study done using students from a college where the researcher works? Does the study recommend a medication when funds to conduct the research were provided by the manufacturer of the medication?
- Were any ethical situations discussed, or were any ethical procedures violated?
- Did the authors obtain institutional review board (IRB) approval and informed consent prior to the start of the study?

What Were the Results of the Study?

What exactly are the results of the study? Do they make sense and answer the research question(s)? For example, in a quantitative interventional study, how significant are the treatment effects? Is there a significant difference between the patients who received the intervention and those who did not? If not, then the study does not prove the intervention is successful, and no practice change should be recommended based on these results. In a qualitative study, did the research approach fit the purpose of the study? Was it congruent? In other words,
7. EVALUATING THE EVIDENCE

did the results of the study make sense and answer the research questions? The results should be a logical explanation of the intent of the research project and should not be erroneous or answer a question other than the research questions. For example, if the researchers were looking at the effect of a nursing intervention in the lived experience of parents of children with a chronic illness, what common threads or themes were found? Do they make sense? Do they fit in the context of the situation or living environment? Did the nursing intervention make a difference or not? If it did not, there would be no need to employ that intervention in your practice. If it did make a difference and the researcher is telling you that it did, examine this intervention further to determine if it might work with your patient population or in your situation.

Are the Results Valid?

Validity means that the results measure what they were supposed to measure. For example, in an experimental or
interventional study, were the participants or subjects randomly assigned to control, treatment, or intervention groups? Were they equal with respect to key characteristics prior to the study? Were intervening or extraneous variables controlled? Suppose the research study measured whether taking acetaminophen (Tylenol) every 4 hours around the clock would keep a child from getting a fever. Did the results show the child was fever free or did the child develop a fever? If the results showed the child subsequently had a fever, then the purpose of the research study (to take acetaminophen every 4 hours around the clock as a fever preventative) did not prove the hypothesis. Thus, you would not want to develop a protocol stating that administering acetaminophen every 4 hours around the clock will prevent a child’s fever.

Are the Results Reliable?

Does the research study measure what it is supposed to measure on subsequent experiences? Consider the previous example involving acetaminophen. If the research study reported that giving acetaminophen every 4 hours alleviated (rather than prevented) fever, did this happen just one time or did it happen consistently for all subjects in the research study? Suppose there were two studies, with varying or contradictory results. If one research study showed that giving acetaminophen every 4 hours around the clock alleviated fever and another study showed that it did not, the second study negates the findings of the first study, and the study results are not conclusive. So based on these two research studies, a practice change should not be implemented.

Will the Results Help Me Provide Improved Care for My Patients?

Were the subjects or participants in the research study similar to the patients of interest in your EBP project? Are the benefits of the intervention or treatment greater than the inherent risks? Will implementation of these results make a difference in caring for your patients? Let’s say that you work with adult patients. Can the results of the pediatric study with acetaminophen be applied to adult patients? No, they cannot. If you are
7. EVALUATING THE EVIDENCE

Do the Results Make Sense for My Patient Population?

If you find the results of a research study farfetched and vastly opposed to your experience and current practice, read it with caution. You do not need to include every research study on a topic as evidence in your EBP project. This is particularly so if the study population, setting, or other key parameters of the study do not match those of the setting where your EBP project would be implemented. Always ask yourself, does this make sense?

These are some basic questions to ask when looking at the results of a research study. Now, let’s look more closely at the actual components of the research study report. A simple worksheet can be used for this purpose (see the appendix to this chapter). The sections that follow break down each component addressed on the worksheet.

KEY AREAS TO EXAMINE WHEN CRITIQUING A RESEARCH STUDY ARTICLE

Type of Study

What Type of Study is the Research Article?

Is it quantitative or qualitative?
Author Qualifications

What are the qualifications of the person who did the research? Is the person qualified to do the study? For example, if you are evaluating a research article on children’s pain levels and the researcher never worked with children and does not routinely assess pain in practice, he or she would not be qualified. Similarly, suppose you are evaluating a research article looking at education of student nurses. It would make sense if the researcher were a professor or someone who understands and works with nursing students.

Title

Does the title describe what the research study is about? Is the title short and concise, or long and convoluted? For example, let’s say you are interested in children’s reactions to stress in the hospital. The title of an article you have located is, “How do adults respond to stress?” This article would not be appropriate for your EBP project because it does not mention the patient population that is the focus of your study (i.e., children).

Abstract

The abstract is the summary of all points of the research study. It should contain enough information to enable you to evaluate key aspects of the study. The abstract should contain the purpose, research question(s), method, and major findings of the study. Does it contain these items, and does it summarize the results of the study? What is the exact method or process the researcher(s) used in conducting the study? How was the study done? Is the topic interesting and relevant to your patient population or the problem of interest for your EBP project?

Introduction

An introductory paragraph should always be included. This paragraph should not only present the topic, but also grab your interest and provide a brief overview of the topic at hand.
What is the research problem? Basically, what is the point of the study? Has the researcher appropriately described the scope of the problem? Does the problem have significance for the nursing profession? How will the research contribute to nursing practice, nursing administration, or nursing education? Is the problem to be addressed formally presented as a statement of purpose, research question, or hypothesis to be tested? Is this information communicated clearly and concisely?

**Purpose**

The purpose of the study should always be stated. It is very important to understand the motivation of researchers and how they feel their research study will advance either nursing science or nursing care. If it is a not a nursing-based study, the researcher should still explain what purpose the study hopes to serve in the health care environment.

**Research Questions**

Every research study should have a research question or questions as a guide. What question(s) does the researcher hope to answer? It is important to note that these questions are not the same thing as the purpose of the study. The research questions should fulfill the purpose, but they are not the same as the purpose.

**Hypothesis**

All quantitative research studies have a hypothesis or prediction of what the researcher thinks is going to happen. By developing a hypothesis, researchers are better able to identify possible sources of their own bias. Most often when researchers conduct research, they have a sense or indication of how the study will turn out. They may be trying to prove their hypothesis or prediction either correct or incorrect. This is an important part of the research study process. It is also important that the hypothesis make sense for the study at hand. It would make no sense to make a prediction
that cannot even be proven by the planned research study. If the report does not formally state any hypotheses, is the reason stated? Do the hypotheses (if any) flow from a theory or previous research? If not, what is the basis for the researcher’s predictions? Are the hypotheses (if any) properly worded (i.e., do they state a predicted relationship between two or more variables)? Is there a rationale for the manner in which they were stated? Are hypotheses stated as research hypotheses or null hypotheses?

**FAST FACTS in a NUTSHELL**

Remember that qualitative studies do not have a hypothesis or test a hypothesis as do quantitative studies. In qualitative studies, the goal is to understand a phenomenon as it naturally exists in the world and to identify common themes. Predictions of outcome are not made. The qualitative researcher uses broad research questions to guide the study and seeks to understand meaningful patterns that evolve.

**Literature Review**

An extensive review of the literature should be completed. It is important to view all research done on a given topic before embarking on any future research. It is commonly said that we need to know where we’ve been to know where we are going or plan to go. The literature review should include relevant research studies, particularly those published within the past 5 years. If older studies are included, their importance should be explained. If they are landmark studies, propose significant changes, or reflect discoveries in the area being researched, include them. Confirm that the coverage of the literature seems thorough and complete. Does it appear that the review includes all or most of the major studies that have been conducted on the topic of interest? Are recent research reports cited? How recent are the reports? Does the review rely on appropriate materials (i.e., mainly on research reports,
using primary or secondary sources)? Is the review organized so that development of ideas is clear? If the review is part of a research report for a new study, does the review support the need for the new research study? If the review is designed to guide clinical practice, does the review support the need for (or lack of need for) changes in practice? Does the review conclude with a synopsis of the state-of-the-art knowledge on the topic? Is the style of the review appropriate? Does the reviewer paraphrase or is there an overreliance on quotations? Does the review appear unbiased? Does the reviewer use appropriate language? Does the review flow logically?

**FAST FACTS in a NUTSHELL**

Keep in mind that the length of time between the completion of a study and its publication in a scholarly journal may be up to 2 years. Therefore, many of the most recent research articles are already outdated before they are published. The time lag to publication varies from journal to journal.

**Ethical Aspects of the Study**

When examining a research study, you want to be sure the study was conducted ethically, especially if you plan to use it for evidence. No study participants should ever be subjected to physical harm, discomfort, or psychological distress. The researchers must take appropriate steps to keep them from being harmed. It is important when doing, and evaluating, research to consider whether the research benefit to participants in the study outweighs any potential risk to them. In addition, consider whether the benefits to society outweigh the costs to the participants. No type of coercion or undue influence should be used in recruiting or selecting the participants. When working with vulnerable subjects, special considerations need to be observed. The participants should never be deceived or tricked in any way to participate in the study. They must be made fully aware that they are participating in a study. It is the responsibility of researchers to ensure that the participants understand
7. EVALUATING THE EVIDENCE

the purpose of the study and why the research is being done. Informed consent must always be obtained. Privacy and confidentiality must also be taken to protect the participants. Lastly, when a research study is conducted in an institution, such as a hospital, the research must be approved and monitored by an IRB or other similar ethics review committee.

Vulnerable subjects are people who are not capable of giving a fully informed consent. This could be the result of mental incapacity or age. Examples of vulnerable subjects are children, mentally challenged or emotionally disabled people, someone in a coma, severely or terminally ill people, and pregnant women. Note that pregnant women can give informed consent, but the unborn fetus cannot. The risk to the unborn fetus must be examined, and the risk–benefit ratio for the pregnant mother and for the fetus must be weighed heavily when embarking on a research study. This is documented in the Code of Federal Regulations, 2005 (available online at www.hhs.gov/ohrp/policy/ohrpregulations.pdf).

**FAST FACTS in a NUTSHELL**

Conceptual and Theoretical Frameworks

A conceptual or theoretical framework guides the study. Remember, the framework does not have to come only from the field of nursing; it can be from another discipline, such as psychology (see Chapter 3). But whatever framework is chosen, it should be relevant for the study. Does it flow? Does the framework make sense for the type of study? Is it explained clearly?

Operational Terms

Operational terms are terms that may have different meanings when used in different contexts. So, the study should explain how such words will be defined. Do the researchers provide definitions of these terms and how each will be used
in the study? If operational terms are used, are the terms and their definitions appropriate for the given study, and do they help to clarify exactly what each term means in the context of the study?

**Research Design**

What is the basic type of design? Remember that there are two main types of research, quantitative or qualitative. Within each of these categories, what type of design is used for the study? For example, is a quantitative study experimental or nonexperimental in design? Recall that in an experimental comparative or randomized study, the study participants are divided into two groups: experimental and control. The first group receives the experimental drug, therapy, treatment, or intervention, whereas the second group does not. Keep in mind that random assignment to these groups is necessary for experimental studies. If study participants are randomly assigned, the results are more credible and can be generalized to other similar studies (Carlson, Kruse, & Rouse, 1999). In addition, examine whether there are variables. If so, how do they affect each other? Identify the basic type of design to help your understanding of the content of the research. See Chapters 4 and 5 for further clarification of the different types of research designs. Always remember to check for bias in the study. Are any influences present that might have affected the results?

**FAST FACTS in a NUTSHELL**

The researcher should try to control threats to validity in any study. Validity is the ability to measure what is supposed to be measured. In research studies, an inference is made, or reasons or causes and a rationale are given describing the study results (the effect). When there are threats to validity, a study may contain incorrect inferences. Although it is hard to control every aspect or outcome of a study, the researcher must try to control as many variables as he or she can.
Population and Sample

How were the subjects or participants for the study selected? Was randomization used?

Quantitative Sampling Designs. Is the population identified, described, and easily accessible? Are eligibility criteria clearly described? Are the sample selection procedures clearly described? What type of sampling plan was used? Does the sample adequately represent the total population? Did some factor affect the representativeness of the sample (e.g., a low response rate)? Are possible sample biases identified? Is the sample size sufficiently large or too small?

Qualitative Sampling Designs. Is the setting adequately described? Is the setting and population appropriate for the research question(s)? How were the participants selected for the study? Was the sampling approach appropriate? Is the sample size adequate, too small, or too large? Did the researcher state that information saturation was achieved?

Data Collection Methods

Who collected the research data? Were the data collectors qualified for this role or is there something about them (e.g., their professional role, their relationship with study participants) that could undermine the collection of unbiased, high-quality data? How were data collectors trained? Does the training appear adequate? Where and under what circumstances were the data gathered? Were other people present during the data collection? Could the presence of others have created any influence or bias? Did the collection of data place any undue burdens (in terms of time or stress) on participants? How might this have affected data quality?

Statistical Significance

Were the collected data statistically significant? All the data in the world could be collected but if they are not statistically significant, they are meaningless. It is very important to achieve statistical significance. The two easiest ways of understanding statistical significance are to look at the p value
Interrater reliability is a term used when two or more individuals, or “coders,” are gathering information during a study. It describes the degree to which they agree. For judging purposes, it is a consensus; that is, how often they agree on a given score. In research, it is how often two observers agree on a given item and the level of agreement between them. This level of agreement is very important in research when more than one person is gathering the data.

and the confidence interval. Review Chapter 4 for further explanation of these concepts.

**Significance for Your Area of Practice**

Most important when evaluating evidence is to ask yourself this question: Is this information significant to my patient population or EBP project? If it is not, then discard it; if it is, keep it for evidence.

**Assumptions and Limitations**

**Assumptions** are presuppositions that the researcher makes about the study before it begins. This is what the researcher is “taking for granted,” so to speak. For example, the researcher may assume that people want to participate in the study.

**Limitations** prevent the study from reaching its full potential. An example would be if a researcher wanted to study the effects of sunshine on people’s happiness, but it rained for the duration of the study. Another example would be if the researcher wanted to study 10-year-old boys, but only two 10-year-old boys were available. These limitations should be discussed and presented.

**Conclusions**

Do you agree with the conclusions the author or researcher drew from the study? In your opinion, did he or she draw incorrect conclusions or jump to conclusions not easily made from the evidence?
Implications for Future Research

Does the author or researcher explain the implications of the findings for future research? These are areas identified by the researcher for further exploration and research. Another researcher may choose to pursue these areas of research, but they also provide ideas for new or novice researchers embarking on a research project. Indeed, reviewing the research literature and current EBP guidelines may help you identify other areas in need of further practice changes for future research projects.

Summary

Ask yourself the basic questions in this section when reviewing evidence for your EBP project. The worksheet that accompanies this chapter (see appendix) does not list all the questions that should be asked but gives the novice a good basis for evaluating research studies. In addition, you should review the guidelines for critiquing quantitative and qualitative studies provided in Chapters 4 and 5 (see Tables 4.2 and 5.2).

In a research study, French (2006) found that specialist nurses use two main criteria, relevance and quality, to evaluate research in practice. Other criteria given in order of frequency were effectiveness, practicality, impact, effort, staff, and feasibility.

- **Effectiveness** meant whether the intervention was going to do what it was intended to do.
- **Practicality** meant whether implementation of an intervention was functional, efficient, or sufficient in meeting the purpose for which it was intended.
- **Impact** described how the patient reacted to the intervention, and whether the intervention could cause a patient any harm.
- **Effort** related to how easy it would be to implement the intervention.
- **Staff** was how nurses would be affected by implementing the intervention.
- **Feasibility** was the last and most consistent criterion examined: How difficult or feasible would it be to implement this nursing intervention?
You will probably relate to these criteria when examining evidence to determine whether to recommend implementation of an intervention in your practice area.

In a second study, Sandelowski and Barroso (2002) examined how to isolate the findings in qualitative research, as sometimes the data are misrepresented as findings. This means that some data are presented that may not be findings that relate to the study at hand. In addition, reports sometimes contain very little description to support the researcher’s interpretations of the data. For example, how does the researcher eliminate his or her own biases in the interpretation of the data? Quotations and descriptions of incidents may be misused. Extensive quoting of participants may be included, but these quotations may not fit with the purpose of the study or the conclusions obtained, or may be excessive in number. Researchers also sometimes do not state how they came up with patterns or themes. Finally, conceptual conclusions or theories that are used may drift from one concept to another and not truly represent the theory given as a basis for a study. These are some of the challenges highlighted by Sandelowski and Barroso (2002) in locating and evaluating the findings in qualitative research articles. So, if you become confused in determining what is good or bad research, do not hesitate to consult a person who has more experience in critiquing research. This can be a colleague, a professor at a local college, or someone in your institution’s research department.

**FAST FACTS in a NUTSHELL**

When rating evidence for EBP, the highest level of evidence is that obtained from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs) or established EBP clinical guidelines.

**THE STRENGTH OF THE EVIDENCE**

How strong is the evidence being used? What level of research is being used? There are numerous ways to grade or evaluate research evidence for use in EBP. The Agency for Healthcare Research and Quality (AHRQ) is a federally funded agency
that supports quality of care and EBP through Evidence-Based Practice Centers (EBPCs) across the United States. The U.S. Preventative Services Task Force (USPSTF), which is supported by AHRQ, evaluates scientific studies related to clinical preventative services and makes recommendations based on specific criteria. These recommendations allow clinicians to make informed practice decisions. This task force grades the evidence using a letter system of A (strongly recommends), B (recommends), C (no recommendation for or against), D (recommends against), or I (insufficient evidence to recommend for or against). The evidence is graded on quality, quantity, and consistency (Long, 2009). More information about this system can be obtained at www.ahrq.gov/research/findings/final-reports/uspstf/uspstfeval.pdf.

The AHRQ recently supported a study in which 121 systems designed to rate evidence were evaluated to determine best practice in this area. The results identified gaps in rating quality, strength of evidence, and application of these grading schemes to the less traditional types of research, such as observational studies. The authors concluded that there is not (nor will there be in the near future) a single system that can be used to grade scholarly work across all disciplines. They also concluded that evidence gathering differs from clinician to clinician. These results show the difficulty in determining exactly what evidence is and how it might best be applied to practice (Malloch & Porter O’Grady, 2005). For more information about this study and current recommendations, see www.ahrq.gov/Clinic/epcix.htm.

One of the most common evidence ratings systems in nursing was put forth by Melnyk and Fineout-Overholt (2010), and consists of a seven-level hierarchy (see Table 1.2). Several other evidence ranking and grading schemes also exist, and controversy over which one is best led to an international effort to develop a universal system of evaluation. In 2000, an informal collaboration of people addressed the shortcomings and multiple evidence-grading systems in health care. The international system that resulted is known by the acronym GRADE, which stands for grades of recommendation, assessment, development, and evaluation. The GRADE rating hierarchy offers another way to evaluate your
evidence to see which of your research articles offers the strongest type of evidence available. It ranks evidence into four levels: (1) high, (2) moderate, (3) low, and (4) very low. The recommendation is either (1) strong or (2) weak (Long, 2009). You can learn more about the GRADE system at www.gradeworkinggroup.org/FAQ/index.htm.

Sometimes it is helpful to have a tool to critique studies when you are first starting out. Please see the appendix to this chapter for an example of a tool you can use.

**FAST FACTS in a NUTSHELL**

Critiquing the evidence in a research study is a complex task and can be very confusing. You should know how to ask questions and review important aspects of the evidence and research reports you find. Understand how to grade the evidence and how to determine what makes evidence strong or weak. Efforts have been undertaken by various groups to develop a uniform system of evidence evaluation, so that research is graded or evaluated in the same way.
APPENDIX

Article Critique Worksheet

When critiquing a research study article, answer the following questions by filling in the blank or circling your response.

1. Is the study quantitative or qualitative?
2. Is the researcher qualified? (yes or no) Why or why not?

3. Is the title appropriate? (yes or no) Clear and concise? (yes or no)

4. Abstract
   • Is the hypothesis or research question present? (yes or no) If so, list it.

   • What is the method of research?

   • Is a description of the findings present? (yes or no)
   • Are the major findings listed? (yes or no) If so what are they?

5. Introduction
   • Introductory paragraph? (yes or no)
   • Does the introduction grab your interest? (yes or no)
   • Any background information? (yes or no)
   • Is the significance to nursing stated? (yes or no)
6. What is the **purpose** of this research article?

7. Is the **research problem** identified? (yes or no) What is it?

8. **Hypothesis**
   - Is the hypothesis stated? (yes or no) What is it?
   - Do you think the hypothesis makes sense (is a good guess) for the given study? (yes or no) Why or why not?

9. **Literature review**
   - How many articles are reviewed by the author and listed in the reference section? ________
   - Is it an adequate number in your opinion? (yes or no)
   - Are the resources relevant to the topic being studied? (yes or no)
   - Are the resources current? (yes or no)
   - How many resources given were published within the past 5 years? ________
   - the past 10 years? ________ are older than 10 years? ________

10. Ethical considerations
    - Were ethical practices used when conducting the study? (yes or no)
    - If not, what was done in the study that you would consider unethical?
11. Theoretical or conceptual framework
   • Was a framework present or not? (yes or no) If so, can you identify it?
   • What type of theory or framework was used?
   • Was this theory or framework from the field of nursing? (yes or no)

12. Operational terms
   • Are operational terms given? (yes or no)
   • Are the terms appropriate for the given study? (yes or no)
   • Do they help clarify the study? (yes or no) Why or why not?

13. Research design
   • We have already classified the main type of research as quantitative or qualitative. Within that main classification, what type of research is it (e.g., experimental or nonexperimental, phenomenological, etc.)?
   • What is the method used to assign subjects?
7. EVALUATING THE EVIDENCE

- Was there randomization? (yes or no)
- Are there any variables? If so, list them below.
  Variable 1:
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________

  Variable 2:
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________

  Variable 3:
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________

  Variable 4:
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________

- Is any bias present? (yes or no) If so, list what you think is biased.
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________

- If the study has bias, think about why. Who funded the study? Who conducted the study? Where do they work? Is a conflict of interest present?
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________

14. Population and sample
- Who was studied?
  ____________________________________________________________
  ____________________________________________________________
  ____________________________________________________________
• What was the age group?

• How many people were studied or used? What is the exact sample size?
  \( n = \) __________

• Do you think this is an adequate sample size? (yes or no) Why or why not?

15. What was the data collection method (e.g., survey, questionnaire, etc.)?

16. Was the study statistically significant?
  • What are the \( p \) values?

  • What is the confidence interval?

17. Was this study significant to the field of nursing? (yes or no) Why or why not?
18. Assumptions and limitations
   • Did the author list any assumptions? (yes or no) If so, what were they?

   __________________________________________________________
   __________________________________________________________

   • Did the author list any limitations? (yes or no) If so, what were they?

   __________________________________________________________
   __________________________________________________________

19. What were the conclusions?
   __________________________________________________________
   __________________________________________________________

20. Implications for future research
   • Were any implications or suggestions for future areas of research given by the author? (yes or no)
   • If so, what are they, and do you find them sensible and appropriate?

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
This chapter examines some of the barriers to conducting research and implementing evidence-based practice (EBP) projects in nursing. Fear of the unknown and the effects of peer pressure, along with strong nursing traditions, sometimes inhibit the development of an EBP environment. In addition, organizational constraints, such as lack of administrative support or incentives to move forward with EBP, are explored. Finally, the chapter discusses how to overcome some of these obstacles.

In this chapter, you will learn:

1. The barriers to implementing EBP
2. How to change your practice environment
3. How technology affects EBP research
4. Ways to disseminate or present EBP research
BARRIERS TO SUCCESSFUL RESEARCH AND IMPLEMENTATION OF EBP

Chapter 1 mentioned various limitations to the implementation of EBP, including the following barriers to successful research:

- Lack of awareness or understanding of EBP
- Lack of association with researchers
- Lack of ability to locate or find relevant research
- Lack of ability to “understand the language” of research
- Lack of recognition of the value of research in nursing practice
- Lack of availability of computer databases
- Lack of basic knowledge of information technology
- Lack of time to obtain research information

These barriers are very real in the practice environment today. We must explore ways to eliminate them, so that nursing can move forward as a profession. Patient-centered care requires that we practice nursing using the latest and best evidence to provide the best care possible for our patients. Collaboration with physicians and other health care practitioners is vital to building a collegial relationship based on trust, respect, and the best evidence. We must never tire of trying to find ways to implement EBP.

Australia and the United Kingdom have been leaders in the implementation of EBP. In the United States, EBP is increasingly being implemented in nursing. The move of hospital institutions to Magnet status could be the impetus for this change. Recall from Chapter 1 that Magnet status is an award given by the American Nurses Credentialing Center (ANCC), an affiliate of the American Nurses Association, to hospitals that satisfy a set of criteria designed to measure the strength and quality of their nursing staffs. A Magnet hospital is one in which nursing results in excellent patient outcomes, where nurses have a high level of job satisfaction, and where there is a low staff nurse turnover rate and appropriate grievance resolution. Magnet status also indicates nurse involvement in data collection and decision-making in patient care delivery. The idea behind this formal recognition is that Magnet
nursing leaders value staff nurses, involve them in shaping research-based nursing practice, and encourage and reward them for advancing in nursing practice. Magnet hospitals are expected to have open communication between nurses and other members of the health care team, and an appropriate personnel mix to attain the best patient outcomes and staff work environment (Center for Nursing Advocacy, 2007). This is accomplished by examining the current research trends and incorporating them into practice. Chapter 1 includes more information about this designation.

**FAST FACTS in a NUTSHELL**

A Magnet hospital is one in which nursing results in excellent patient outcomes, where nurses have a high level of job satisfaction, and where there is a low staff nurse turnover rate and appropriate grievance resolution.

But what do you do if the institution where you work is a smaller agency or does not have Magnet status? Where do you start to attract interest for EBP?

It is wise to first assess the particular barriers to EBP in your facility. You might accomplish this using a simple informal survey or a more formal focus group. A focus group brings together a small group of individuals to discuss a topic and respond to questions posed by a moderator or facilitator. For example, the topic could be the nursing staff’s knowledge base, attitudes, beliefs, and thoughts regarding the research process and how to use research or evidence in practice. In addition, the focus group could be used to determine to what degree staff members believe implementing EBP will result in improved patient care or better outcomes. **If staff do not believe that EBP will result in improved care and patient outcomes, the facilitator could provide examples or real-case scenarios of how this would occur.**

In addition, providing such examples, particularly those that produce cost savings, is well received by administrators’ and generally increases their willingness to consider
implementing EBP. For example, if you work in a private nursing home and you are trying to implement an EBP environment, you might use the latest research to show that switching to an incontinent device that initially costs a dollar more than the device currently being used could eventually save hundreds of dollars in linen services and decubitus care, and result in better outcomes for patients. Presented in this way, the proposal is more likely to be taken under closer consideration by the administration. It is paramount for nurses to articulate the value of interventions within an economic framework that maintains institutional viability, and EBP provides a means to do so.

FAST FACTS in a NUTSHELL

If health care practitioners do not believe that EBP will result in improved care and patient outcomes, the facilitator needs to provide examples or real-case scenarios of how this would occur.

CHANGING THE PRACTICE ENVIRONMENT

Issues of nursing availability, productivity, working conditions, and the aging of the nursing workforce cannot be ignored. Today, many health care organizations are struggling to deal with the consequences of a decades-long nursing shortage. The move to restructure hospitals in the early 1990s resulted in reductions in the educated nursing workforce, ultimately threatening the clinical viability of these organizations at the same time that clinical interventions were becoming more complex. The productivity decisions made then have taken a large toll on the nursing resources of today’s health care organizations. The historic lack of connection between the economic viability of these organizations and nursing satisfaction and performance is an important factor to consider when looking at the future financial and operational viability of health care organizations.
Nurses are indeed at the “crossroads of care” in the health care organization. It is the nurses’ role to be the “eyes of the physician” and to quickly evaluate, coordinate, integrate, and facilitate all of the clinical functions related to the delivery of patient care. While this is a vital nursing function, nurses also must recognize the need to evaluate their clinical practice to determine whether it delivers optimal patient outcomes. This is where nursing must take the lead and be proactive. The process of reframing nursing calls for nurses to critically evaluate the clinical foundations of nursing practice as we as support health care institutions facing increased financial pressures. EBP is one method that nurses can use to improve patient outcomes. It takes the nurse from a previous focus only on the clinical process to a new focus that requires attention to clinical outcomes (Malloch & Porter-O’Grady, 2005).

FAST FACTS in a NUTSHELL

Nurses function at the “crossroads of care” in health care organizations. Their role is to be the “eyes of the physician” and to quickly evaluate, coordinate, integrate, and facilitate all of the clinical functions related to the delivery of patient care. But it is also vital that nurses evaluate the evidence associated with their clinical practice. EBP takes the nurse from a previous focus only on the clinical process to a new focus that requires attention to clinical outcomes.

TECHNOLOGY, DATABASES, AND EBP

It is imperative that the latest and best evidence be incorporated into EBP. This process is aided when nurses have access to the databases that contain information and research studies that can affect care. If your institution provides access to scientific databases, that is excellent. If it does not, obtain information about accessing the databases and the cost to
acquire them, and then provide that information to the leaders or managers of your institution. As noted in Chapter 6, some services, such as Science Direct, EBSCO, and OVID, provide databases for a fee, and bundle packages for purchase. These services are an expensive proposition for smaller institutions, but an argument can be made that access to these databases will support the infrastructure of research and advancing science in your institution. **Make an argument for EBP.** You might also make an argument for a joint venture between departments or institutions to purchase the full-text online databases, thus decreasing the cost to an individual department or institution. “Buddying” with a local college or university that has a health sciences curriculum is another option. Remember that content for some journals included in these databases is not available electronically for up to a year. So, it may be wise to subscribe to important research journals or encourage staff to go directly to journal websites that offer free access to their most recent issues, as well as e-zines and e-journals that are available on the Internet (see Chapter 6).

**LACK OF KNOWLEDGE ABOUT EBP**

It is vital that classes be offered to educate the staff about EBP. Lack of knowledge about EBP or fear of the unknown is sometimes the single most important barrier to convincing colleagues to get on board and understand the process. In a 2002 study, Jolly noted that nurses’ attitudes toward research and development were poor until a program was developed to assist them in understanding how to read and critically appraise research articles. Programs or classes may be held as formal or informal inservice education to assist in this process.

Many nurses are fearful not only about the process of searching for research articles, but also about what to do with them when they find them. Addressing this knowledge gap should be a focus of future educational development. As more nurses are required to take research courses, the question must be asked: Do those courses go far enough in
deciphering for enrollees what to do with the research studies they find to change practice? This text was written with the goal of providing a guide to simplify this often daunting and overwhelming task and alleviate the bedside nurse’s fear of the EBP process.

Along with providing your support, which is invaluable in alleviating fears, encourage your peers to visit databases, such as the Cochrane Library and the National Guidelines Clearinghouse (discussed in Chapter 1), which provide completed systematic reviews and EBP guidelines for implementation. Check local colleges and universities for courses about EBP. Online resources for learning about EBP are also available through nursing schools, and selected centers have developed around the world with the primary purpose of promoting EBP (Table 8.1). Even when nurses understand research, many do

<table>
<thead>
<tr>
<th>TABLE 8.1 Online Resources for Tutorials on Evidence-Based Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>AANA, American Association of Nurse Anesthetists, free EBP tutorial</td>
</tr>
<tr>
<td>A Student’s Guide to Medical Literature, University of Colorado Health Sciences Center</td>
</tr>
<tr>
<td>Center for Advancing Clinical Excellence at the University of Texas Health Science Center at San Antonio</td>
</tr>
<tr>
<td>Center for Health Evidence</td>
</tr>
<tr>
<td>Center for Research and Evidence-Based Practice at the University of Rochester School of Nursing</td>
</tr>
<tr>
<td>Joanna Briggs Institute</td>
</tr>
<tr>
<td>Sara Cole Hirsh Institute for Best Nursing Practice Based on Evidence at the Frances Payne Bolton School of Nursing, Case Western Reserve University</td>
</tr>
</tbody>
</table>
8. BARRIERS TO DISSEMINATING THE EVIDENCE

not have the skills to access evidence or evaluate it for potential decision making (Polit & Beck, 2014).

Melnyk and Fineout-Overholt (2010) analyzed 44 systematic reviews focusing on the effects of strategies to change the practice of health care professionals. They noted that little research had been done to develop and sustain EBP and drew the following conclusions:

• Passive dissemination of research is ineffective.
• A range of interventions has been shown to be effective in changing the behavior of health care professionals.
• Multifaceted interventions are more likely to be effective than a single intervention.
• Individual practitioners’ beliefs, attitudes, and knowledge influence their behavior, but other factors, including organizational, economic, and community environments, also are important.
• A diagnostic analysis should be conducted to identify barriers and supportive factors likely to influence the proposed change in practice.
• Successful strategies to change practice need to be adequately resourced and require people with appropriate knowledge and skills.

The diverse personalities, health professionals, and clinical settings that make up today’s health care organizations underscore the importance of involving more resources and support, as well as effecting a paradigm and culture shift in the organization. Strategies suggested by Melnyk and Fineout-Overholt (2010) include:

• One-on-one sessions between health professional educators and individual staff to explain the desired practice change or the concepts of EBP
• Manual and computerized reminders to prompt the practitioner behavior change in practice
• Educational meetings or inservice education that requires active participation of the learners
• Audits and feedback in which clinical performance is monitored through electronic database or chart review
• Direct observation and feedback
Other sources suggest these additional strategies:

- Involvement of unit-based committees, such as performance improvement (PI), quality assurance (QA), or policy and procedure committee members, to facilitate the EBP process.
- Journal or research article clubs that enhance the discussion of a particular article per month. Several studies (Jolly, 2002; Karkos & Peters, 2006; McQueen, Miller, Nivison, & Husband, 2006; Wilson & Collins, 2005) found that journal clubs increased awareness, knowledge, confidence, and skills in research.
- Poster presentations in which units within an institution share with the entire health care institution ideas and EBP projects created, ongoing, or developed by each unit.
- A nursing research day, with presentations and seminars to encourage participation and facilitate understanding of EBP.

**OFFERING INCENTIVES**

Incentives are a motivational tool that can be used to stimulate interest and bring about change in the workplace environment. Contests can be arranged, with prizes given. Providing free food is one way to improve attendance at an EBP program. Free t-shirts, book bags, or pen giveaways are other ways of generating interest and increasing attendance. A simple gift of a chocolate bar for attendance might suffice as a motivational factor for some. Survey the population you will be working with and provide incentives of interest to that group.

**INCLUDING EBP IN PERFORMANCE APPRAISALS**

Another idea that managers can use to implement and facilitate environmental change is to require involvement in EBP as part of annual performance appraisals. A monetary incentive tied to employees’ annual appraisals can be a great motivating force to move staff toward involvement in the EBP process. When you make EBP part of your “unit culture,”
it will become a real process that is valued by the administration. You can make a difference, particularly in providing great patient care and cost savings for the institution in which you work.

**TIME AND SUPPORT**

Most importantly, administrators must realize that they cannot expect nurses to “fit” research and EBP into their normal daily care schedule. Most managers recognize the rigor and demands of the clinical work environment, and that time away from the job must be allotted to encourage participation and interest. Administrative support for this process is vital. It is well worth the time involved to present the EBP process to management and enlist the support of the administration before embarking on the EBP process. Staff release time or paid conference time is vital, as is encouraging your institution to facilitate research by buying into research databases, or “buddying” or sharing the cost with a local college or university. In this way, health care professionals support EBP and each other.

**DISSEMINATING THE EVIDENCE**

Once you have gained interest and support for EBP, new and exciting projects can be planned and implemented. Do not forget to share your results with colleagues. So much of the wonderful work done in nursing is never published or shared. Below are a few ways that we can share our efforts and successes in moving the science of nursing forward.

**PRESENTING EVIDENCE-BASED PRACTICE INFORMATION**

EBP projects and successful implementation strategies can be presented at local conferences, national conferences, or intrahospital inservice educational programs. Publication in
a nursing journal is a way of reaching a larger audience to disseminate important work.

**Oral Presentations**

When presenting the information you have developed about an EBP project, be both systematic and organized. Most conference presentations are approximately 20 to 30 minutes long. When planning a presentation, be clear and concise. If presenting PowerPoint slides, be sure the type size used on the slides is at least 28 point in the selected font, so that attendees can read them clearly from the back of the room. You should also use sharp and contrasting colors that are easily read in a large room. Use black when writing on a white background and white when writing on a black background. Avoid the overuse of clip art or pictures that will detract from your professional presentation.

To organize your content, start by making an outline. **Start every presentation with objectives or a list of the outcomes you want the learner to achieve.** Then clearly present your EBP project. You can follow the steps below:

1. Introduce your clinical problem or EBP topic.
2. State the purpose you hoped to achieve with your project or problem of interest. What is it that you wanted to change in practice, or what inspired you to examine this topic?
3. Include any theoretical or conceptual frameworks that may have guided your work (not usually used in EBP, but more often included in a nursing research project).
4. Detail the interventions you implemented or examined in your EBP project.
5. **Provide a brief summary of the evidence.** This can be done in a table using the format and style recommended by the American Psychological Association (APA). (See Chapter 9 for examples of evidence tables.) You may want to include the ranking or hierarchy of evidence (e.g., randomized controlled trial [RCT], level 1, or highest and strongest type of evidence). You may also want to include clinical practice guidelines that have already been established.
6. What did you find in conducting your project that led (or did not lead) to a practice change? This is a summary of your findings. Also include the implications that your findings will have for future practice, and areas where additional research may be needed.

This presentation can take place live in a conference, an institutional, or a clinical setting, or as a poster presentation. More information about these methods follows.

**Panel Discussions**

Panel discussions are sometimes used to share and discuss the findings of EBP issues or research. The panel is usually a group of experts in the field. Before the discussion, determine the allotted amount of time for each speaker and which speaker will handle which topic. Remember to allow a question-and-answer period to encourage the audience to participate in the discussion. This can be done in a professional conference setting or informally in an institutional or a clinical setting.

**Poster Presentations**

Poster presentations are probably the easiest way to disseminate current nursing information. Poster presentations may be given at local or national conferences. Sharing information at a national conference provides important and timely information for colleagues and practitioners. The methods of composing and sharing the poster differ depending on the type of organization sponsoring the event. Be sure to check the requirements for submitting an abstract of a poster, and the actual poster criteria, before sending any information. Many conferences have size requirements and may or may not provide instruments to hang the poster if needed. The typical size for a poster is 4 feet by 6 feet. It is also important
to plan the graphics and pictures incorporated in a poster. The golden rule is for the attendee at the conference to be able to view the poster from 4 feet away. Some other items to consider in presenting a poster are as follows:

- Consider the audience attending the conference, including the language of the attendees. Do the members speak primarily English? Are they professional medical people or laypeople. If laypeople, medical jargon may be confusing to them.

- Make the poster readable. Vary the size of the font used in the poster. Do not make the letters too small or too large or they will detract from the content of the poster. The conference attendee should be able to read the poster highlights from four feet away.

- Use pictures or graphics only when they add to the content of your poster. A few graphics are eye pleasing if they are relevant, but too many graphics make the poster look “busy” and can frustrate the reader.

- Use a font that is easy to read. Consider the typical fonts you use to write a paper, such as Times New Roman or Arial. Use the same font throughout the poster. You can use a special or decorative font, such as comic sans, at a pediatric conference if it is appropriate for the type of conference.

- Avoid shadowing the letters. This can make them hard to read.

- Consider providing attendees with handouts that summarize your poster and provide your contact information. You can also distribute business cards that attendees can take to their own practice environment and share with their colleagues. These handouts can be in color or black and white. The handouts can be an outline of your information or a copy of the poster itself. Consider cost when making handouts. Color is obviously more expensive.

- Be present at your poster during scheduled poster exhibit times to answer any questions that conference attendees may have. This also gives you time to network with other professionals in your practice area.
Small Group Presentations

The results of your EBP study can be shared in small groups at a multitude of places. This can be done among a few (three to six) of your peers or colleagues over a lunch or dinner break; on the clinical unit or in a classroom or auditorium; through a grand-rounds type presentation; through professional committee meetings (either unit-based or hospital- or institution-wide); or, if relevant, in the community or at a comparable agency or worksite.

Professional Publications

Did you ever wonder who writes the articles in the journals you read? The answer is, people just like you. If you develop an EBP project or simply want to share the review of literature you compiled, consider publishing your findings in a professional journal or publication. Remember, journals can be published in a print version or online in an electronic version. Many nurses are apprehensive about the process of submitting an article for publication, and uncertain how to do so. However, the process is usually quite easy and not something to fear. The following suggestions can help as you begin this process:

1. First, identify an idea or topic of interest. What types of nursing are you interested in? What field of nursing is your interest or expertise? What is your passion? What happens in your clinical work area that bothers you or peaks your curiosity so that you want to learn more about it? Identify an issue. You can consult your peers, do some brainstorming, or look in the journals you receive. Many times there are sections or a page in the journal citing areas of interest in publishing, such as EBP topics, ethical issues, practice issues, and new procedures or products.

2. Write your article or conduct your EBP project. If you need assistance, consider a mentor. Speak with a colleague or associate who has published. Consult a previous instructor or professor.
3. *Proofread* or have others read and critique your work. Asking for insight and suggestions to improve your work may sometimes create the tone and excitement for EBP.

4. *Select a journal of interest related to your topic.* It certainly would not be appropriate to write an article or EBP project focused on a pediatric issue such as immunizations and then seek to publish it in a geriatric or an emergency/trauma journal. Select a journal that is relevant to the topic of interest.

5. *Follow the journal’s guidelines for submission,* which are usually posted online on its website and can also be found on the masthead of print editions. Steps 4 and 5 are discussed in more detail below.

In most cases you will want to select a journal that is scholarly or peer reviewed. A peer-reviewed journal is one that is reviewed by a panel of experts in the field. Peer-reviewed journals are more intensely reviewed than those reviewed by another process. This is the ideal and most respected type of publication. However, if this is your first submission, you may want to submit your work to a non–peer-reviewed journal. Again follow the guidelines for that type of journal. There is nothing wrong with “trying the process out” with this type of journal. As you progress in your scholarly work, it is best, however, that you publish in peer-reviewed journals.

As mentioned, the requirements for submission of a manuscript can be found either in the journal or on its website. To locate a journal’s guidelines online, enter the name of the journal into your search engine, go to the journal’s homepage, and then look for “author guidelines” or “author submissions.” Follow them exactly to avoid time-wasting delays or rejection of your submission. The journal may recommend that you submit a letter of query. This is simply a letter sent to the editors telling them that you have written a manuscript about a particular topic, and asking if the editorial board would be interested in looking at it. If you receive a positive response, you would then submit the manuscript. If the response is negative, you should look for another journal until you find one that is interested in your subject area or topic of interest.
Information covered in the author submission guidelines includes:

- The length of the manuscript
- The type of paper and size on which it is to be submitted
- The required font and its size
- Spacing requirements
- Requirements for abstracts
- Style for bibliographies; for nursing journals, this is usually APA format
- How to organize the body of the manuscript
- How to handle graphics, tables, or charts
- A description of the review process and the timeline for feedback to the author

These items vary by publication, and there may be different sets of guidelines depending on whether you are submitting your manuscript electronically or as a hard copy (typed format). Most manuscripts are now submitted electronically. Some journals also use submission software that allows the author to establish an account and check the status of the manuscript online at the publisher’s website. Just remember to follow the author guidelines closely. Swanson, McCloskey, and Bodensteiner (1991) surveyed 92 nursing journals to determine the main reason for manuscript rejection. The highest ranked reason was that they were poorly written. This was also cited in a survey by McConnell (2000). Other reasons for manuscript rejection cited by Swanson and colleagues (1991) were undocumented content, unimportant content, clinically inapplicable findings, statistical problems, incorrectly interpreted data, and overly technical content.

Mee (2006) shares the following nine lessons on writing for publication.

1. **Be confident.** You can be a nurse author. Writing is not just for those in academic settings. Many nurses like to read about other nurses in similar situations and how they solved problems.
2. **Start small.** Don't overwhelm yourself with a large topic such as pneumonia. Find an aspect of the broader topic you are passionate about, and explore it.
3. *Topic development takes time and effort.* Many nurses are intimidated and think ideas just pop into a writer's head. The truth is that many authors take a lot of time to develop their topic and focus.

4. *Gather more resources than you think you will need.* Conduct a literature search and then read all the articles you have found. Immerse yourself in the topic. Writing will be easier if you know the topic well.

5. *Know the journal you want to write for.* There are more than 150 nursing journals, both general and specialized. Choose three journals that you think might be a good fit for your article. Then read those journals to see if the articles match your style. Follow the author guidelines and don't forget to submit a letter of interest or a query letter.

6. *Start writing in the middle.* Don't waste time trying to come up with the perfect title. Get the ideas on paper as a rough draft, and then go back to fix and clarify your points.

7. *Use the active rather than the passive voice.* The active voice connects with the reader. In contrast, the passive voice is indirect, vague, and puts distance between the author and the reader.

8. Multiple rewrites are the norm, so *plan for at least three rewrites.*

9. Lastly, *pay attention to detail.* Again follow the author guidelines, and put together a cleanly written and organized manuscript. Careless errors in spelling or punctuation will undermine your credibility as a writer with the editor. Then walk away and wait. Once this process is completed, and you see your name in print as an author, you will have a sense of pride and accomplishment like you have never known. So, go for it, take a chance, and write (Mee, 2006).

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**FAST FACTS in a NUTSHELL**

Remember that the process of publishing an article in a professional journal can be a long one. An article often is not be published for several months, and the lag time to publication may approach a year. This diminishes
the timeliness of important research. The best way to transmit current research information to your peers in a timely fashion is to present it at a conference. Whichever method you choose, make sure that you do share your research. This is how the body of nursing knowledge will grow—if we all share and collaborate.
EXAMPLE 1

Step 1: Come Up with the Idea

EBP Project: Placement of postpyloric feeding tubes in the pediatric intensive care unit

The interest in this topic evolved from working with the pediatric population in the pediatric intensive care unit (PICU) and examining the decreased incidence of aspiration pneumonia. The occurrence of aspiration pneumonia has decreased in sedated ventilated patients who were being fed enterally.

Step 2: Use the PICO/T Method: Determine the Population of Interest

Population (P)
- Pediatric patients admitted to the PICU who are mechanically ventilated

The Intervention (I)
- Placement of postpyloric feeding tubes for all mechanically ventilated patients
Comparison (C)
• Postpyloric feeding tubes versus gastric feeding tubes

Outcome (O)
• Decreased incidence of aspiration pneumonia in the PICU patients receiving long-term mechanical ventilation

Step 3: Identify the Team Members Involved
• Project leader: Maryann Godshall
• Six-nurse insertion team: Loretta Smith, Brenda Jones, Beth Sands, Jen Long, Pat Pine, and Maryann Godshall
• MD consultant: Dr. Kerrie Pinkney (intensivist)

Step 4: Develop a Timeline

9/20/07: First meeting
9/30/07–10/30/07: Gather evidence in literature
11/1/06–5/1/07: Study period
6/1/07: Project complete

Step 5: Identify Search Terms
• Postpyloric tube feedings
• Long-line tube feedings
• Gastric tube feedings
• Jejunal tube feedings
• Enteral tube feedings
• Aspiration pneumonia
• Transpyloric tube feedings

Step 6: Determine Search Engines
• CINAHL
• EBSCO
• OVID online
Step 7: Gather the Evidence and Prepare an Evidence Table

Table 9.1 is an example of the evidence compiled from just two of the research articles found for this project.

Step 8: Summarize Your Evidence

- The evidence shows that transpyloric feeding tubes can be placed by the blind method easily (< 5 minutes) and successfully (88.7%) in the PICU.
- This method should not be used in the neonatal intensive care unit (NICU).

Step 9: Identify Practice Implications

- Transpyloric tube feedings can be placed easily and successfully in the PICU.
- Evidence shows that transpyloric tube feedings decrease the incidence of aspiration pneumonia.
- To decrease the incidence of aspiration pneumonia in the PICU, the placement of transpyloric tube feedings should be implemented.

Author’s note: This is just one example of an EBP project. You can tailor the process to meet your institution’s needs. Not all institutions rate the evidence. If you do rate the evidence, there are numerous rating scales available for you to use.

EXAMPLE 2

Step 1: Come Up with the Idea

EBP Project: Implementation of a Rapid Response Team in a Community Hospital
### TABLE 9.1 Example of an Evidence Table

<table>
<thead>
<tr>
<th>Reference</th>
<th>Purpose/ Hypothesis Research Question</th>
<th>Sample</th>
<th>Classification of evidence</th>
<th>Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mcquire, W., &amp; McEwan, P. (2006). Transpyloric versus gastric tube feeding for preterm infants. The Cochrane Library. OVID online</td>
<td>Does feeding via the transpyloric route vs. the gastric route improve feeding tolerance, and growth and development without increasing adverse consequences?</td>
<td>8 studies undertaken from 1970s through early 1980s. Very low birth weight infants (less than 1500 grams). Only infants grown appropriately for gestational age were used. Some of the infants on respiratory or ventilatory support were not included.</td>
<td>3A–systematic review of homogeneity of case-control studies</td>
<td>Randomized or quasirandomized controlled trials comparing transpyloric vs. gastric tube feedings in preterm infants</td>
<td>No evidence of benefit of transpyloric feeding in preterm infants. There were adverse effects found and therefore feeding preterm infants via the transpyloric route cannot be recommended.</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Reference</th>
<th>Purpose/ Hypothesis Research Question</th>
<th>Sample</th>
<th>Classification of evidence</th>
<th>Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joffe, A.R., Grant, M. Wondg, B., &amp; Gresiuk, C. (2000).</td>
<td>Blind insertion of transpyloric feeding tubes in pediatric intensive care is highly successful</td>
<td>Children in pediatric intensive care without fudoplication, pharyngeal trauma, or gastric ulceration whose intensivists requested TP feedings. Patients who were hemodynamically unstable to tolerate the procedure and those who had an absent cough while not endotracheally intubated were also excluded. Patients were &lt; 17 yrs old. Average age 0.73–198 months of age and weighed 3–70 kg. The diagnosis included post-op heart surgery (n=15), resp failure (n=7), septic shock (n=4), coma (n=4), traumatic brain injury (n=3), airway maintenance (n=3), and burns (n=2). 69% were ventilated, 15.5% had pharmacologic paralysis, 78.9% has continuous infusion of sedation. Tubes were nasally placed in 94.4% and orally placed in 5.6% of patients.</td>
<td>2C–Outcomes Research</td>
<td>Prospective Interventional Study</td>
<td>71 feedings tubes inserted in 38 patients over a 9-month period from 2/99–10/99. Success rate of blind transpyloric feeding tube insertion was 88.7%. The average insertion time took an average of 5 minutes.</td>
</tr>
</tbody>
</table>
The interest in this topic evolved from working in the hospital and wanting to decrease the “code blue” events. Our team wondered if implementation of a rapid response team in our institution would decrease the incidence of respiratory and cardiac arrests in the adult population.

**Step 2: Use the PICO/T Method: Determine the Population of Interest**

**Population (P)**
- Adult patients older than 18 years of age admitted to a community hospital

**The Intervention (I)**
- Implementation of a procedure and education of staff in the process of calling a rapid response

**Comparison (C)**
- Incidence of “code blue” events before and after putting in place a rapid response team

**Outcome (O)**
- Decreased incidence and number of “code blue” events in the hospital

**Step 3: Identify the Team Members Involved**
- Project leader: Maryann Godshall
- Six-nurse team: Loretta Smith, Brenda Jones, Beth Sands, Jen Long, Pat Pine, and Maryann Godshall
  - ICU charge nurse: Becky Reid
  - Respiratory therapist: Kay Fritz
- MD consultant: Dr. Kerrie Pinkney, intensivist

**Step 4: Develop a Timeline**

1/20/15: First meeting
3/30/15–5/30/15: Gather evidence in literature
6/1/15–12/31/15: Study period
1/31/16: Project complete

Step 5: Identify Search Terms

- Code blue
- Rapid response
- Rapid intervention
- Respiratory support
- Respiratory arrest (and outcomes)
- Cardiac arrest (and outcomes)
- Critical assessment teams (CAT) calls

Author’s note: These teams are known by different acronyms at various institutions.

Step 6: Determine Search Engines

- CINAHL
- EBSCO
- OVID online
- Cochrane Database
- PubMed

Step 7: Gather the Evidence and Prepare an Evidence Table

Table 9.2 is a more detailed example of an evidence table.

Step 8: Summarize Your Evidence

- The evidence shows that implementing a rapid response team in one study decreased cardiac arrests, but was inconclusive in the other study. More research is needed.

Step 9: Identify Practice Implications

- Additional evidence should be evaluated to see if implementing a rapid response team has more favorable outcomes.
### TABLE 9.2 Example of a More Detailed Evidence Table

<table>
<thead>
<tr>
<th>First author/Publication/Year</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Major Variables Studied (and Their Definitions)</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth to Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chan PS, et al. Arch Intern Med 2010; 170(1): 18–26</td>
<td>None</td>
<td>SR</td>
<td>Purpose: effect of RRT on HMR and CR</td>
<td>N = 18 out of 143 potential studies</td>
<td>RRT: was the MD involved?</td>
<td>Frequency</td>
<td>13/16 studies reporting leam structure</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Searched 5 databases from 1950–2008 and “gray literature” from MD conferences</td>
<td></td>
<td></td>
<td>Relative risk</td>
<td>7/11 adult and 4/5 peds studies had significant reduction in CR</td>
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<td></td>
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<td></td>
<td>• Included only 1. RCTs and prospective studies with 2. A control group or control period and 3. Hospital mortality well described as outcome</td>
<td></td>
<td></td>
<td></td>
<td>CR: cardio and/or pulmonary arrest; cardiac arrest calls</td>
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<td>• Excluded 5 studies that met criteria due to no response to e-mail by primary authors</td>
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<td>Average no. beds: NR</td>
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<td></td>
<td></td>
<td></td>
<td>Setting: acute care hospitals; 13 adult, 5 peds</td>
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<td></td>
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<td>IV: RRT DV1: HMR (including DNR, excluding DNR, not treated in ICU, no HMR definition) DV2: CR</td>
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<td></td>
<td></td>
<td></td>
<td>Setting: acute care hospitals; 13 adult, 5 peds</td>
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<td>Average no. beds: NR</td>
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</tr>
</tbody>
</table>

#### Weaknesses:
- Potential missed evidence with exclusion of all studies except those with control groups
- Gray literature search limited to medical meetings
- Only included HMR and CR outcomes
- No cost data

#### Strengths:
- Identified no. of activations of RRT/1,000 admissions
- Identified variance in outcome definition and measurement (for example, 10 of 15 studies included deaths from DNRs in their mortality measurement)

#### Conclusion:
- RRT reduces CR in adults, and CR and HMR in peds

(continued)
# TABLE 9.2 Example of a More Detailed Evidence Table (continued)

<table>
<thead>
<tr>
<th>First author/Publication/Year</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Major Variables Studied (and Their Definitions)</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth to Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>McGoughey J. et al.</td>
<td>None</td>
<td>SR (Cochrane review)</td>
<td></td>
<td>Purpose: effect of RRT on HMR</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cochrane Database Syst Rev</td>
<td></td>
<td></td>
<td></td>
<td>• Searched 6 databases from 1990–2006</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007;3: CD005529</td>
<td></td>
<td></td>
<td></td>
<td>• Excluded all but 2 RCTs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N = 2 studies</td>
<td>IV: RRT</td>
<td></td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Acute care settings in Australia and the UK</td>
<td>DV1: HMR</td>
<td></td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Attrtion: NR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OR of Australian study, 0.98 (95% CI, 0.83–1.16)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CR of UK study, 0.52 (95% CI, 0.32–0.85)</td>
<td></td>
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</tr>
</tbody>
</table>

Feasibility:
- RRT is reasonable to implement; evaluating cost will help in making decisions about using RRT
- Risk/Benefit (harm): benefits outweigh risks

Weaknesses:
- Didn’t include full body of evidence
- Conflicting results of retained studies, but no discussion of the impact of lower level evidence
- Recommendation “need more research”

Conclusion:
- Inconclusive
### TABLE 9.2 Example of a More Detailed Evidence Table (continued)

<table>
<thead>
<tr>
<th>First author/Publication/Year</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Major Variables Studied (and Their Definitions)</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth to Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winters BD, et al. <em>Crit Care Med</em> 2007;35(5):1238.43</td>
<td>None</td>
<td>SR</td>
<td>N = 8 studies</td>
<td>IV: RRT DV1: HMR DV2: CR</td>
<td>HMR: overall death rate</td>
<td>Risk ratio</td>
<td>HMR: • Observational studies, risk ratio for RRT on HMR, 0.87 (95% CI, 0.73–1.04)</td>
<td>• Provides comparison across studies for Study lengths (range, 4–82 months) Sample size (range, 2,183–199,024)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Average no. beds: 500</td>
<td>CR: no. of in-hospital arrests</td>
<td></td>
<td>Risk ratio</td>
<td>CR: • Observational studies, risk ratio for RRT on HMR, 0.76 (95% CI, 0.39–1.48)</td>
<td>• Criteria for RRT initiation (common: respiratory rate, heart rate, blood pressure, mental status change; not all studies, but noteworthy: oxygen saturation, “worry”)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>CR: • Cluster RCTs, risk ratio for RRT on HMR, 0.70 (95% CI, 0.56–0.92)</td>
<td>• Includes ideas about future evidence generation (conducting research)—finding out what we don’t know</td>
</tr>
</tbody>
</table>
### TABLE 9.2 Example of a More Detailed Evidence Table  (continued)

<table>
<thead>
<tr>
<th>First author/Publication/Year</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Major Variables Studied (and Their Definitions)</th>
<th>Measurement</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth to Practice</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CR, 0.94 (95% CI, 0.79–1.13)</td>
<td>Conclusion: • Some support for RRT, but not reliable enough to recommend as standard of care</td>
</tr>
</tbody>
</table>

CI, confidence interval; CR, cardiopulmonary arrest or code rates; DNR, do not resuscitate; DV, dependent variable, HMR, hospital-wide mortality rates; ICU, intensive care unit; IV, independent variable; MD, medical doctor; NR, not reported; OR, odds ratio; Peds, pediatrics; RCT, randomized controlled trial, RR, relative risk: RRT, rapid response team; SR, systematic review; UK, United Kingdom

Adapted from Fineout-Overholt, Melnyk, Stillwell, and Williamson (2010).
• A rapid response team should be implemented and research conducted in our institution to monitor whether the incidence of “code blue” is decreased.
• Findings should be discussed with the “code blue” team, followed by brainstorming after reviewing the evidence, to identify different ways that may be more effective for utilizing rapid response teams to prevent the progression of patients to a full “code blue” status in our institution.
References


REFERENCES


Qualitative research methods in nursing (pp. 40–51). Fort Worth, TX: Harcourt College Publishers.
REFERENCES


Stetler, C. B., Updating the Stetler Model of research utilization to facilitate evidence-based practice. *Nursing Outlook, 49*(6), 272–279


Abstract A brief summary about the research article. It should contain the purpose, methods, and major findings of the study. By reading an abstract, the researcher should be able to understand the basic highlights of a research article.

Aesthetic knowledge Abstract information that gives us an appreciation of the deeper meaning of the situation. It takes an inductive approach to knowledge acquisition.

Assumptions Statements and principles that are taken as truth, based on a person’s values and beliefs.

Bias Occurs when researchers interject their personal beliefs into the study. This is a deviation from the true results of the study.

Biophysiological measure A measure that includes both in vivo and in vitro measures. A biophysiological method is one that tests an instrument of some kind.

Bivariate study A study with two variables. One variable is usually the dependent variable, and one is the independent variable.

Blinding Occurs during the research process when the subjects do not know if they are in the experimental group or the control group.

Borrowed theories Theories taken from another discipline, for example, psychology, and applied to nursing questions and research problems.

Bracketing The process by which researchers identify their own personal biases about the phenomenon of interest to clarify their personal experiences and beliefs that may alter or reflect what is heard and reported.
Case studies In-depth examinations of people or groups of people. In a case study, institutions or facilities could be examined, for example, an inpatient psychiatric unit.

Clinical practice guidelines Systematic reviews that put a large amount of evidence into a manageable and usable format. They give specific practice recommendations for making evidence-based practice (EBP) decisions, address the issues relevant to a clinical decision, which include balancing the benefit and risks of a EBP decision, and are developed to help guide clinical practice even when there is limited available evidence.

Community-based participatory action research A method of research that involves the community to take an active part in all stages of the research process, including planning, conducting, implementing, and evaluating.

Comparative studies Studies that look at the difference between intact groups on some dependent variable of interest.

Comparison Occurs when an individual assesses the similar and dissimilar characteristics of a particular object, situation, or research variable.

Concepts The building blocks of theories that are used to describe a phenomenon or a group of phenomena. A concept gives some degree of classification or categorization.

Conceptual model In research, similar to a conceptual framework. It is a set of abstract and general concepts that are assembled to address a phenomenon of central interest.

Confidence intervals Reflect the degree of risk researchers are willing to take of being wrong. With a 95% confidence interval, researchers accept the probability that they will be wrong only 5 times out of 100.

Constructs Higher level concepts that are derived from theories and that represent nonobservable behaviors.

Control or comparison group The group not receiving the intervention of interest or the group with which the experimental group is compared.

Correlational studies Studies in which the researcher examines the strength of the relationship between variables by determining how the change in one variable is associated with the changes in another variable.

Cross-sectional A survey or study that looks at people at one point in time.

Cumulative Index to Nursing and Allied Health Literature (CINAHL) First published in 1961, and still published today, it covers nursing and allied health journals, including dental hygiene, nutrition,
occupational therapy, physical therapy, physician’s assistant, and respiratory therapy journals. It is an index to print and online articles.

**Database** A collection of data or information stored in a computer. You can think of it as an electronic filing system.

**Dependent variable** The “effect” or that which is influenced by the independent variable. The dependent variable can also be called the criterion, or outcome variable.

**Descriptive studies** Studies that describe things or objects, the phenomena of interest, or the relationship between variables. This is different from an exploratory study in that there would be information in the literature about the phenomena of interest in a descriptive study.

**Descriptive theory** Empirically driven theory that describes or classifies specific characteristics or aspects of individuals, groups, situations, or events by summarizing items in common that are found by direct observations.

**Directional hypothesis** Shows that there is an expected direction in the relationship between variables.

**Double blinding** A two-way process in which neither the researcher nor the subject knows who received the intervention and who is in the control group in a study.

**Effect size** The magnitude of the impact of an intervention or variable is expected to have on the outcome.

**Emic** Intrinsic or from the internal perspective of a culture.

**Empirical knowledge** What we know through our physical senses; something we can hear, touch, taste, and see. Investigations of these areas are best handled through quantitative methods of knowledge discovery.

**Ethical knowledge** That by which we make moment-to-moment decisions. What is right, what should be done, and what is good. This type of knowledge directs our personal conduct in life.

**Ethnography** A qualitative study that explores the cultural aspects of a particular group of informants.

**Ethnonursing** A qualitative study that explores the cultural aspects of a particular group of informants in relation to nursing or how they perceive aspects of nursing care.

**Etic** Extrinsic, or from the external perspective of a culture.

**Experimental group** The group of subjects receiving the intervention of interest.

**Explanatory research studies** Studies in which the researcher searches for causal explanations. This method is much more rigorous than exploratory or descriptive research. The researcher
provides an explanation for the relationships that are found among the phenomena.

**Explode** A technique used to expand a database search to include other terms. This is done by including additional narrower subject headings in the key word list.

**Exploratory studies** Studies conducted when little is known about the phenomena.

**Extraneous variables** Variables that are not under investigation or examination, but may (or may not) be relevant to or interfere with the study. Extraneous variables may be controlled or uncontrolled by the researcher. The researcher should identify any extraneous variables when possible to avoid interference with the study or the occurrence of any adverse or unplanned effects. Extraneous variables may also be called confounding variables, intervening variables, or mediating variables.

**Feminist research** Research that focuses on gender domination and discrimination within patriarchal societies. These researchers seek to establish a nonexploitive relationship with their informants and to conduct research that transforms these perceived boundaries.

**Field notes** Notes the researcher may take about an interview to help to remember facts that were important to the study (usually done after the interview is completed).

**Focus** Technique used to narrow a search when using certain computer databases.

**Grand theories** Complex and broad in scope. They try to explain broad areas and include many concepts that are not usually grounded in empirical data (data gathered through the senses using objective measurement) or evidence.

**Grounded theory** A qualitative approach in which a theory is developed that is grounded in the data obtained from research studies in which data is collected and analyzed.

**Hawthorne effect** Occurs when the subjects in a study change their behavior, actions, or answers to questions because they know they are being studied. They may answer a question the way they think the researcher wants it answered as opposed to how they really feel.

**Health Insurance Portability and Accountability Act of 1996 (HIPAA)** A law passed by the U.S. Congress that created national standards for maintaining the privacy of electronic medical information. An institution, such as a hospital, can disclose individually identifiable health information (IIHI) from its records if a patient signs an authorization gaining access.
Hyperlink A link (in the form of a web address or words in a text document) that automatically connects a computer (links it) with an item of interest that is accessible online. Hyperlinks are used to make access to online information easier.

Hypothesis In research, a prediction about the relationship between two or more variables.

Immersion A research technique in which the researcher spends time at the place of interest, so that the participants or informants gain trust in the researcher or simply get to know the researcher, enabling more open discussions.

Independent variable The “cause,” or the variable that influences the dependent variable.

Index Medicus The best known index of medical literature, first published in 1879. Although still available on library shelves, print publication ceased in December 2004 with volume 45. In 1997 this database became available for free on the Internet through MEDLINE.

Instrumental case study Used when a researcher is pursuing insight into an issue or wants to challenge some generalization and the particular case was instrumental or of utmost importance to the subject being studied.

Integrative review A scholarly paper that synthesizes published studies and articles to answer questions about a phenomenon of interest; this type of review is frequently found in peer-reviewed professional publications. It provides generalizations about substantive issues from a set of studies that have direct bearing on those issues.

Interrater reliability The degree to which two or more individuals, or “coders,” gathering information during a study agree. For judging purposes, it is a consensus, or how often they agree on a given score. In research, it is how often two observers agree on a given item and the level of agreement between them.

Intervention An action that is performed with the defined patient population. A nursing intervention is a nursing measure that is physically done to a patient.

In vitro A measure taken from a participant in a study and then subjected to laboratory analysis, such as the measuring of a potassium level, bacterial count, or a tissue biopsy.

In vivo A measure that is performed directly within or on a living being. (Examples include blood pressure, heart rate, and respiratory rate.)

Key informant A person who is knowledgeable about the population of interest to a researcher. He or she might also be able to provide the researcher with access to the designated population.
**Key words** Terms that describe the subject of interest in a research study.

**Landmark studies** Studies that may have been published more than 5 years ago but are considered paramount to the direction of study of a particular topic. These studies are significant to the understanding of the topic.

**Letter of query** A letter sent to the members of the editorial board of a journal or magazine asking if they would be interested in evaluating an article for possible publication.

**Level of significance** A measure of how much evidence a researcher has collected against the null hypothesis. It is written as a probability value, or $p$ value. If the $p$ value is less than 0.05, the result is significant. If the $p$ value is greater than 0.05, the result is not considered significant.

**Longitudinal survey or study** A study that follows subjects over a period of time.

**Meta-analysis** The process of combining results of studies into a measureable format, statistically estimating the effects of proposed interventions, and critically reviewing them to minimize bias.

**Metaparadigm** A primary phenomenon of interest to a particular discipline. The nursing metaparadigm usually consists of four components: the person, the environment, health, and how the concept of nursing fits into the metaparadigm.

**Methodological studies** Studies in which the researchers look at the method; these studies are used mainly to test instruments or look at the development, testing, and evaluation of research instruments.

**Middle-range theories** Theories that focus on only a piece of reality or human experience, involving a selected number of concepts, such as theories of stress.

**Narrative research** A type of research that allows people to “tell their own stories” to uncover their motivations, desires, or feelings in a multitude of settings.

**Nondirectional hypothesis** Shows no direction between the variables studied.

**Null hypothesis** Complete lack of or absence of a relationship between the variables studied.

**Nursing Studies Indexes (NSI)** An annotated guide to English-language reports of studies and historical and bibliographical materials about nursing. It is helpful when looking for material published during the first half of the 20th century (1900–1959).
Outcome The end result. What one wants to accomplish or measure.

Peer-reviewed journal A journal in which all articles are reviewed by experts in the field of the research topic. An article must pass the test of usually more than one expert or reviewer before it is accepted for publication. The review process usually takes place in a blinded fashion, in which reviewers do not know the author. All identifying author criteria and credentials are omitted from the article prior to the review process.

Personal knowledge The shared human experience and humanistic qualities of knowing. It concerns our inner experience.

Phenomenology A method that explores the meaning of human experience through the “lived experience” of the individual.

Pilot study A small-scale trial run of a larger research study, usually using a smaller number of subjects.

Population The group of individuals a researcher wants to examine. It can be infants, toddlers, preschoolers, adolescents, or adults of a particular age. It can also be a group of individuals, such as psychiatric patients with the diagnosis of schizophrenia.

Practice theories More specific than middle-range theories, these theories produce specific directions or guidelines for practice. An example is the theories of end-of-life decision making.

Prescriptive theories Theories that address nursing therapeutics and the outcomes of interventions. A prescriptive theory includes propositions that call for change and predict the consequences of a certain strategy for nursing intervention.

Primary data sources Eyewitness accounts from the time being studied. Research studies by people who were actually present, or the person who conducted the research or wrote about it.

Problem statement A sentence that formally addresses the problem being examined. It is the “what” of the study. It should include the scope of the research problem, the specific population being studied, the independent and dependent variables, and the goal or question the study is trying to answer. It can be in the form of a declarative statement or an interrogatory question.

Purpose The reason the problem is being examined. It is the “why” of the study.

Purposive sampling A sampling method in which researchers use their own judgment in selecting people who will be representative of the group that the researcher is interested in exploring. For example, the researcher may go to a battered woman’s shelter to study the lived experience of abusive relationships.
Qualitative research  Research that is considered subjective and is more flexible in design. It describes an individual experience. It usually has a written narrative or verbal description. There usually are fewer participants in the study sample.

Quantitative research  A type of research that is objective, imposes tight control over the research situation, and often has a rigorous and controlled design. It generalizes findings and frequently includes numbers, facts, and figures. When you think of quantitative research; think quantity. The sample study usually has a large number of participants or subjects.

Quasi-experimental design  Similar to an experimental design except that there is no randomization or comparison group.

Randomization  A procedure that assures that every subject has an equal chance of being chosen for the experiment.

Reliability  The ability to measure what one wants to measure on subsequent experiences.

Research problem  An area of concern or one in which there may be a gap in knowledge or literature that is in need of a solution.

Research questions  Statements of the specific query or investigation to answer or address a research problem. In some cases, they are a direct rewording of the statement of purpose, which is then phrased as a question.

Research utilization  Application of a single research study or part of a study to something unrelated to the original research.

Retrospective study  A study that looks backward in time to data already obtained and on record. This type of study can be done by reviewing charts of previously collected data.

Saturation  A point that is reached when common themes are found in qualitative research and no new information is obtained. This is called the point of saturation.

Search engine  An information retrieval system that is stored on a computer system such as the World Wide Web. One of the most popular today is Google.

Secondary data sources  A view or account of an event by someone other than an eyewitness.

Scope  In a searchable database, represented by an icon that enables you to check the scope of a term and its synonyms.

Single blinding  A one-way process in which subjects do not know if they are in the experimental group or the control group.

Standard deviation  Shows the average amount of deviation of values away from the mean. A standard deviation is a useful
variability index for describing a distribution and interpreting individual scores in relation to other scores in the sample.

**Systematic review** A state-of-the-art summary of all the research information available at a given time on a particular subject. This is not a literature review, but a review of actual research studies. Items in a systematic review all address a specific clinical question.

**Truncation** Used to find words with a similar stem and variant word endings. A common symbol of truncations is the asterisk (*).

**Univariate study** A study with just one variable.

**Validity** The ability of an instrument to measure what it is supposed to or intended to measure.

**Vulnerable subjects** Special groups of people in a research study whose rights need to be protected because they are unable or incapable of providing an informed consent. Examples include children, unconscious adults, mentally retarded or emotionally disabled people, severely ill or physically disabled people, or people who are terminally ill. Pregnant women are included because of possible unintended side effects to the unborn child, who is considered vulnerable.
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