SIXTH EDITION

EVIDENCE-BASED PRACTICE FOR NURSES

APPRAISAL AND APPLICATION OF RESEARCH

THE PEDAGOGY

Evidence-Based Practice for Nurses: Appraisal and Application of Research, Sixth Edition drives comprehension through various strategies that meet the learning needs of students while also generating enthusiasm about the topic. This interactive approach addresses different learning styles, making this the ideal text to ensure mastery of key concepts. The pedagogical aids that appear in most chapters include the following:

CHAPTER OBJECTIVES

At the end of this chapter, you will be able to:

- Define *evidence-based practice* (EBP).
- List the three components of EBP.
- Distinguish EBP from research utilization.
- List sources of evidence for nursing practice.
- Identify barriers to the adoption of EBP and pinpoint strategies to overcome them.
- Explain how the process of diffusion facilitates moving evidence into nursing practice.
- Explain the purpose of the hierarchy of evidence.
- Discuss the development of the hierarchy of evidence in health care.
- Distinguish among the types of evidence found in the seven levels of the hierarchy of evidence.
- Explain why nurses have an ethical obligation to maintain an evidence-based practice.
- Identify ethical concerns that may be raised when implementing EBP.

KEY TERMS

barriers
case-control studies
case series studies
case study
clinical practice guidelines (CPGs)
cohort studies
concept analysis
correlational designs
descriptive survey designs
early adopters
EBP project
evidence-based practice (EBP)
hierarchy of evidence
innovation
integrative reviews
laggards
meta-analysis
metasynthesis
mixed methods design
model of diffusion of innovations
narrative reviews
qualitative research
quality improvement (QI) projects
quantitative research
quasi-experimental designs
randomized control trials (RCTs)
research utilization
summaries
synopses
systematic review
theory

Chapter Objectives

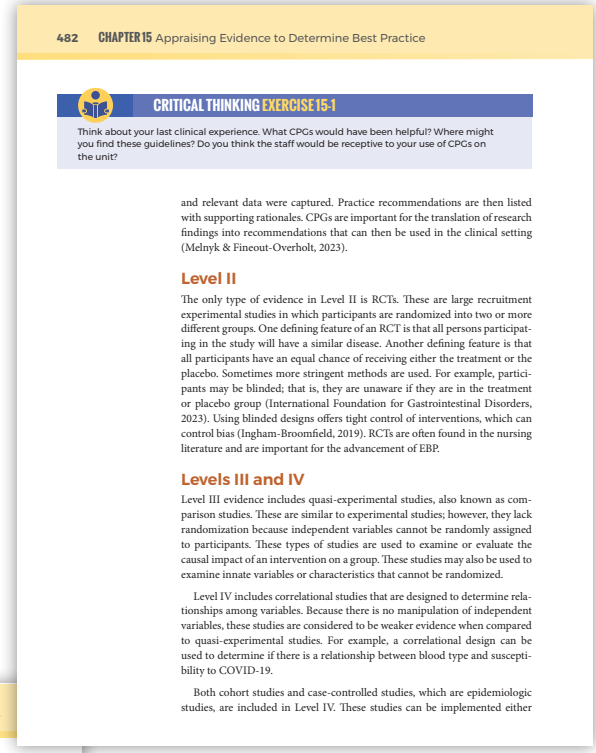
These objectives provide instructors and students with a snapshot of the key information they will encounter in each chapter. They serve as a checklist to help guide and focus study.

Key Terms

Found in a list at the beginning of each chapter and in bold within the chapter, these terms will create an expanded vocabulary in evidence-based practice and research.

Critical Thinking Exercise

As an integral part of the learning process, the authors present scenarios and questions to spark insight into situations faced in practice.



482 CHAPTER 15 Appraising Evidence to Determine Best Practice

CRITICAL THINKING EXERCISE 15-1

Think about your last clinical experience. What CPGs would have been helpful? Where might you find these guidelines? Do you think the staff would be receptive to your use of CPGs on the unit?

and relevant data were captured. Practice recommendations are then listed with supporting rationales. CPGs are important for the translation of research findings into recommendations that can then be used in the clinical setting (Melnyk & Fineout-Overholt, 2023).

Level II

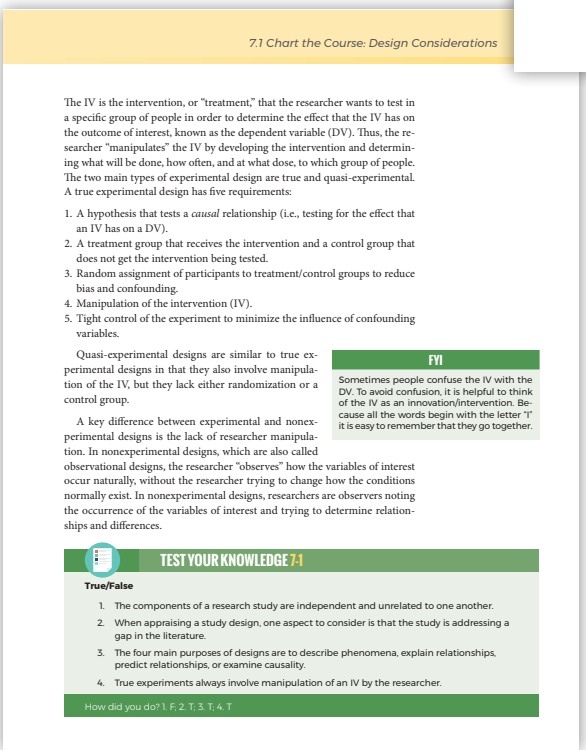
The only type of evidence in Level II is RCTs. These are large recruitment experimental studies in which participants are randomized into two or more different groups. One defining feature of an RCT is that all persons participating in the study will have a similar disease. Another defining feature is that all participants have an equal chance of receiving either the treatment or the placebo. Sometimes more stringent methods are used. For example, participants may be blinded; that is, they are unaware if they are in the treatment or placebo group (International Foundation for Gastrointestinal Disorders, 2023). Using blinded designs offers tight control of interventions, which can control bias (Ingham-Broomfield, 2019). RCTs are often found in the nursing literature and are important for the advancement of EBP.

Levels III and IV

Level III evidence includes quasi-experimental studies, also known as comparison studies. These are similar to experimental studies; however, they lack randomization because independent variables cannot be randomly assigned to participants. These types of studies are used to examine or evaluate the causal impact of an intervention on a group. These studies may also be used to examine innate variables or characteristics that cannot be randomized.

Level IV includes correlational studies that are designed to determine relationships among variables. Because there is no manipulation of independent variables, these studies are considered to be weaker evidence when compared to quasi-experimental studies. For example, a correlational design can be used to determine if there is a relationship between blood type and susceptibility to COVID-19.

Both cohort studies and case-controlled studies, which are epidemiologic studies, are included in Level IV. These studies can be implemented either



7.1 Chart the Course: Design Considerations

The IV is the intervention, or "treatment," that the researcher wants to test in a specific group of people in order to determine the effect that the IV has on the outcome of interest, known as the dependent variable (DV). Thus, the researcher "manipulates" the IV by developing the intervention and determining what will be done, how often, and at what dose, to which group of people. The two main types of experimental design are true and quasi-experimental. A true experimental design has five requirements:

1. A hypothesis that tests a *causal* relationship (i.e., testing for the effect that an IV has on a DV).
2. A treatment group that receives the intervention and a control group that does not get the intervention being tested.
3. Random assignment of participants to treatment/control groups to reduce bias and confounding.
4. Manipulation of the intervention (IV).
5. Tight control of the experiment to minimize the influence of confounding variables.

Quasi-experimental designs are similar to true experimental designs in that they also involve manipulation of the IV, but they lack either randomization or a control group.

FYI

Sometimes people confuse the IV with the DV. To avoid confusion, it is helpful to think of the IV as an innovation/intervention. Because all the words begin with the letter "I" it is easy to remember that they go together.

A key difference between experimental and nonexperimental designs is the lack of researcher manipulation. In nonexperimental designs, which are also called observational designs, the researcher "observes" how the variables of interest occur naturally, without the researcher trying to change how the conditions normally exist. In nonexperimental designs, researchers are observers noting the occurrence of the variables of interest and trying to determine relationships and differences.

TEST YOUR KNOWLEDGE 7-1

True/False

1. The components of a research study are independent and unrelated to one another.
2. When appraising a study design, one aspect to consider is that the study is addressing a gap in the literature.
3. The four main purposes of designs are to describe phenomena, explain relationships, predict relationships, or examine causality.
4. True experiments always involve manipulation of an IV by the researcher.

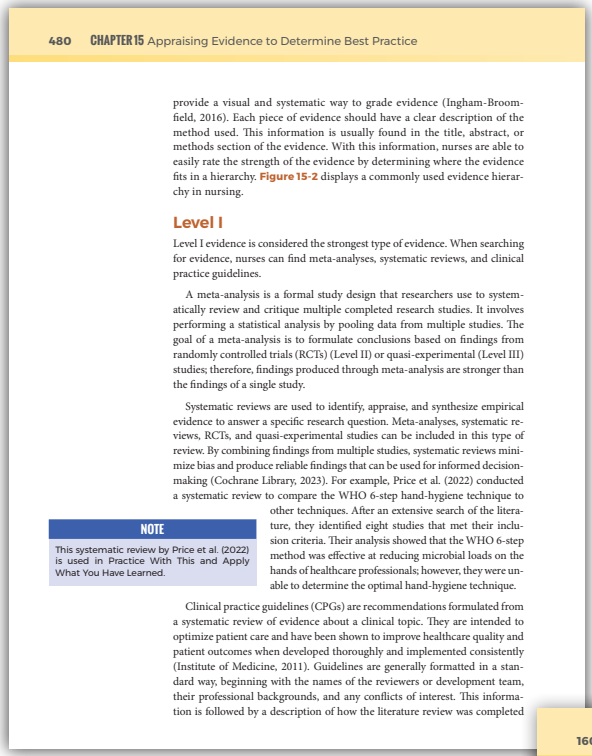
How did you do? 1. F, 2. T, 3. T, 4. T

FYI

Quick tidbits and facts are pulled out in the chapter margins to highlight important aspects of the chapter topic.

Test Your Knowledge

These questions serve as benchmarks for the knowledge acquired throughout the chapter.



480 CHAPTER 15 Appraising Evidence to Determine Best Practice

provide a visual and systematic way to grade evidence (Ingham-Broomfield, 2016). Each piece of evidence should have a clear description of the method used. This information is usually found in the title, abstract, or methods section of the evidence. With this information, nurses are able to easily rate the strength of the evidence by determining where the evidence fits in a hierarchy. **Figure 15-2** displays a commonly used evidence hierarchy in nursing.

Level I

Level I evidence is considered the strongest type of evidence. When searching for evidence, nurses can find meta-analyses, systematic reviews, and clinical practice guidelines.

A meta-analysis is a formal study design that researchers use to systematically review and critique multiple completed research studies. It involves performing a statistical analysis by pooling data from multiple studies. The goal of a meta-analysis is to formulate conclusions based on findings from randomly controlled trials (RCTs) (Level II) or quasi-experimental (Level III) studies; therefore, findings produced through meta-analysis are stronger than the findings of a single study.

Systematic reviews are used to identify, appraise, and synthesize empirical evidence to answer a specific research question. Meta-analyses, systematic reviews, RCTs, and quasi-experimental studies can be included in this type of review. By combining findings from multiple studies, systematic reviews minimize bias and produce reliable findings that can be used for informed decision-making (Cochrane Library, 2023). For example, Price et al. (2022) conducted a systematic review to compare the WHO 6-step hand-hygiene technique to other techniques. After an extensive search of the literature, they identified eight studies that met their inclusion criteria. Their analysis showed that the WHO 6-step method was effective at reducing microbial loads on the hands of healthcare professionals; however, they were unable to determine the optimal hand-hygiene technique.

NOTE

This systematic review by Price et al. (2022) is used in Practice With This and Apply What You Have Learned.

Clinical practice guidelines (CPGs) are recommendations formulated from a systematic review of evidence about a clinical topic. They are intended to optimize patient care and have been shown to improve healthcare quality and patient outcomes when developed thoroughly and implemented consistently (Institute of Medicine, 2011). Guidelines are generally formatted in a standard way, beginning with the names of the reviewers or development team, their professional backgrounds, and any conflicts of interest. This information is followed by a description of how the literature review was completed

Note

A feature in chapters to draw attention to research articles that are available through nursing and medical databases, demonstrating the application of research principles. The articles are also used in the Practice With This and Apply What You Have Learned components of the textbook.

Case Example

Found in select chapters, these vignettes illustrate research questions and studies in actual clinical settings and provide critical thinking challenges.

160 CHAPTER 6 Linking Theory, Research, and Practice

relevant for practice, either at the level of basic research or at the level of applied research. Some researchers claim their work is nursing research because the researcher is a nurse or because the researcher studied nurses. But it is the focus on nursing practice that defines nursing research. The mere fact that the research was conducted by a nurse or that nurses were studied does not necessarily qualify the research as nursing research. Historically, and even today, approaches to practice are often based on "professional opinion" when research is absent. **Case Example 6-1** provides such a historical illustration. It also demonstrates the value of systematically studying the effects of interventions.

This case example clearly illustrates how knowledge changes over time and how ineffective practices are replaced with innovations. What is state-of-the-art practice at one time is replaced when new knowledge based on evidence

CASE EXAMPLE 6-1

Early Methods of Resuscitation: An Example of Practice Based on Untested Theory

Throughout the past century, nursing students have been taught how to resuscitate patients who stop breathing. As early as 1912, students were taught a variety of methods for providing artificial respiration. It was theorized that moving air in and out of the lungs would be effective. One of these techniques was designed for resuscitating infants. Byrd's method of infant resuscitation (Goodnow, 1919) directed the nurse to hold the infant's legs in one hand, and the head and back in the other. The nurse would then double the child over by pressing the head and the knees against the chest. Then the nurse would extend the knees to undouble the child. This would be repeated, but "not too rapidly" (Goodnow, 1919, p. 305). At intervals, the nurse would dip the child into a mustard bath in the hope this would also stimulate respiration. The nurse would continue this until help arrived.

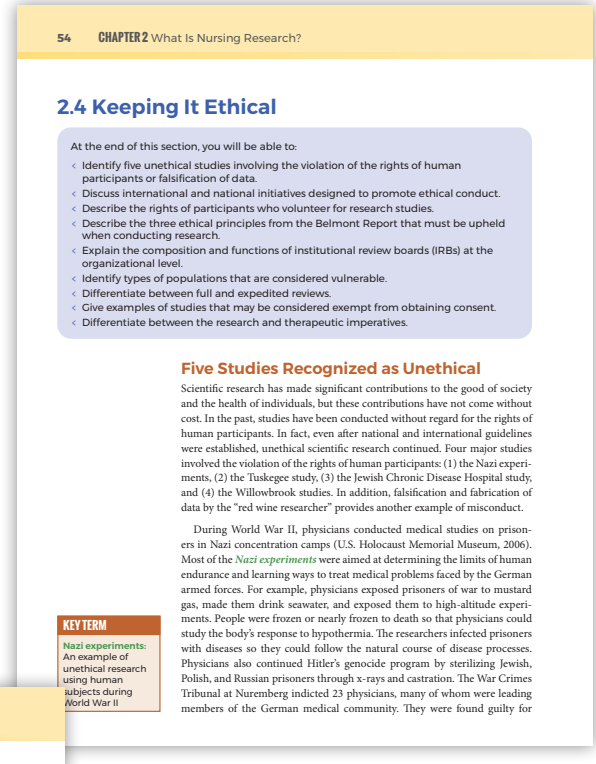
Other methods of artificial respiration taught included Sylvester's method for adults (Goodnow, 1919). The patient was placed flat on his back. The nurse would grasp the patient's elbows and press them close to his sides, pushing in the ribs to expel air from the chest. The arms would then be slowly pulled over the head, allowing the chest to expand. The arms would be lowered to put pressure on the chest, and the cycle was then repeated. This was to be done at the rate of 18 to 20 cycles per minute.

By 1939, postmortem examinations after unsuccessful resuscitations showed veins to be engorged while the arteries were empty (Harmer & Henderson, 1942). Although this evidence indicated other factors needed to be considered, resuscitation techniques continued to focus only on the respiratory system. The same methods of resuscitation that were in use in 1919 were still being taught in 1942. Although students were still being taught the Sylvester method, they were also learning the new "Schäfer method" (Harmer & Henderson, 1942, p. 9401). This method involved placing the patient in a prone position. The nurse would straddle the thighs, facing the patient's head, and alternatively apply and remove pressure to the thorax.

Eventually, it was noted that what was believed to be best practice was not effective. Results of postmortem examinations indicated that something was missing in the techniques, and therefore research was begun to determine best practice. Today, nursing students are taught cardiopulmonary resuscitation techniques based on updated research and theories.

Keeping It Ethical

Relevant ethical content near the end of each chapter to ensure that ethics are a consideration during every step of the nursing process.



54 CHAPTER 2 What Is Nursing Research?

2.4 Keeping It Ethical

At the end of this section, you will be able to:

- Identify five unethical studies involving the violation of the rights of human participants or falsification of data.
- Discuss international and national initiatives designed to promote ethical conduct.
- Describe the rights of participants who volunteer for research studies.
- Describe the three ethical principles from the Belmont Report that must be upheld when conducting research.
- Explain the composition and functions of institutional review boards (IRBs) at the organizational level.
- Identify types of populations that are considered vulnerable.
- Differentiate between full and expedited reviews.
- Give examples of studies that may be considered exempt from obtaining consent.
- Differentiate between the research and therapeutic imperatives.

Five Studies Recognized as Unethical

Scientific research has made significant contributions to the good of society and the health of individuals, but these contributions have not come without cost. In the past, studies have been conducted without regard for the rights of human participants. In fact, even after national and international guidelines were established, unethical scientific research continued. Four major studies involved the violation of the rights of human participants: (1) the Nazi experiments, (2) the Tuskegee study, (3) the Jewish Chronic Disease Hospital study, and (4) the Willowbrook studies. In addition, falsification and fabrication of data by the "red wine researcher" provides another example of misconduct.

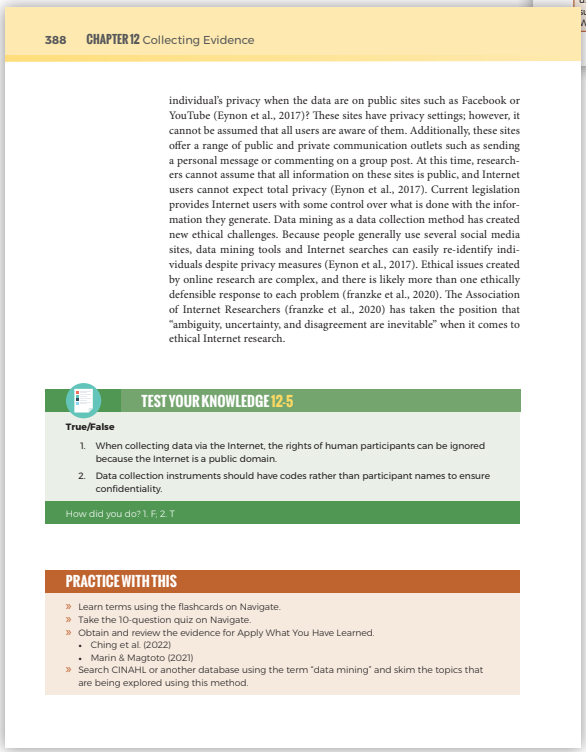
During World War II, physicians conducted medical studies on prisoners in Nazi concentration camps (U.S. Holocaust Memorial Museum, 2006). Most of the *Nazi experiments* were aimed at determining the limits of human endurance and learning ways to treat medical problems faced by the German armed forces. For example, physicians exposed prisoners of war to mustard gas, made them drink seawater, and exposed them to high-altitude experiments. People were frozen or nearly frozen to death so that physicians could study the body's response to hypothermia. The researchers infected prisoners with diseases so they could follow the natural course of disease processes. Physicians also continued Hitler's genocide program by sterilizing Jewish, Polish, and Russian prisoners through x-rays and castration. The War Crimes Tribunal at Nuremberg indicted 23 physicians, many of whom were leading members of the German medical community. They were found guilty for

KEY TERM

Nazi experiments: An example of unethical research using human subjects during World War II

Practice With This

New to this edition, practical learning activities available within the Navigate online course coupled with innovative opportunities to reinforce student learning.



388 CHAPTER 12 Collecting Evidence

individual's privacy when the data are on public sites such as Facebook or YouTube (Eynon et al., 2017)? These sites have privacy settings; however, it cannot be assumed that all users are aware of them. Additionally, these sites offer a range of public and private communication outlets such as sending a personal message or commenting on a group post. At this time, researchers cannot assume that all information on these sites is public, and Internet users cannot expect total privacy (Eynon et al., 2017). Current legislation provides Internet users with some control over what is done with the information they generate. Data mining as a data collection method has created new ethical challenges. Because people generally use several social media sites, data mining tools and Internet searches can easily re-identify individuals despite privacy measures (Eynon et al., 2017). Ethical issues created by online research are complex, and there is likely more than one ethically defensible response to each problem (franzke et al., 2020). The Association of Internet Researchers (franzke et al., 2020) has taken the position that "ambiguity, uncertainty, and disagreement are inevitable" when it comes to ethical Internet research.

TEST YOUR KNOWLEDGE 12-5

True/False

1. When collecting data via the Internet, the rights of human participants can be ignored because the Internet is a public domain.
2. Data collection instruments should have codes rather than participant names to ensure confidentiality.

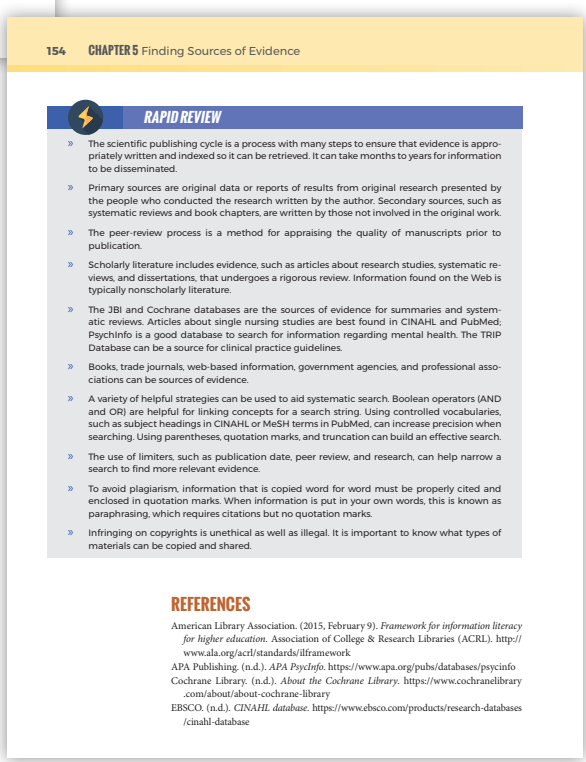
How did you do? 1. F, 2. T

PRACTICE WITH THIS

- Learn terms using the flashcards on Navigate.
- Take the 10-question quiz on Navigate.
- Obtain and review the evidence for Apply What You Have Learned.
  - Ching et al. (2022)
  - Marin & Magtoto (2021)
- Search CINAHL or another database using the term "data mining" and skim the topics that are being explored using this method.

Apply What You Have Learned

This outstanding feature applies newly acquired knowledge to specific evidence-based practice scenarios and research studies. Students are guided through the EBP process as they read and analyze different types of evidence, make a practice decision, and plan for implementing a practice change to improve hand hygiene.



Rapid Review

This succinct list at the end of the chapter compiles the most pertinent and key information for quick review and later reference.

SIXTH EDITION

EVIDENCE-BASED PRACTICE FOR NURSES

APPRAISAL AND APPLICATION OF RESEARCH

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DEDICATION

To my mom, whose love is unconditional.

—*N. A. S.*

To my husband, my children, and my granddaughters and grandsons, who enrich my life in every way.

—*J. M. B.*

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PREFACE

As the COVID-19 pandemic showed us, the need for developing an evidence-based practice is critical for health care. Because COVID-19 was an emerging disease, healthcare providers had limited evidence when caring for patients, so they often resorted to trial and error or basing decisions on treatments for other diseases. It was critical to quickly establish an evidence base to reduce morbidity and mortality rates. Development of vaccines became an international effort and occurred in record time. Currently, treatments needed for long COVID are under investigation. This pandemic serves as an exemplar of how science is a process of describing, explaining, and predicting so that innovations are moved to the point of care. This pandemic also illustrates that EBP content is more important than ever for ensuring that nursing students are workplace-ready.

The American Association of Colleges of Nursing (AACN) charges nursing programs with preparing baccalaureate nurses with the basic understanding of the processes of nursing research. Additionally, Melnyk et al. (2023) identify specific EBP competencies necessary for nurses. Strategies used in our textbook help students develop skills to apply research findings from nursing and other disciplines to their clinical practice. The primary audience for this textbook is baccalaureate undergraduate nursing students and their faculty in an introductory nursing research course. However, we recognize that nursing graduate programs are also using this text and have continued to include a chapter about the appraisal of evidence.

We have kept the model of diffusion of innovations (Rogers, 2003) as the framework, which gives readers a logical and useful means for creating an EBP. Readers are led step by step through the process of examining the nursing practice problem of hand hygiene using the innovation–decision process (IDP). It is recommended that faculty use this text with students to guide them through assignments that might affect actual change in patient care at a healthcare facility. Schmidt and Brown (2007) described this teaching strategy more fully. Because students typically express that research content is uninteresting and lacks application to real life, we have tried to create a textbook that is less foreboding and more enjoyable through the use of friendly language and assignments to make content more pertinent for students.

This edition continues to follow the five steps of the IDP: knowledge, persuasion, decision, implementation, and confirmation. This organizational approach allows the research process to be linked with strategies that promote progression through the IDP. The chapters follow a consistent format: Chapter Objectives, Key Terms, major content, Test Your Knowledge, Keeping It Ethical, Practice With This, Apply What You Have Learned, Rapid Review, and References. Critical thinking exercises and user-friendly tables and charts are interspersed throughout each chapter to allow readers to see essential information at a glance. The hierarchy of evidence is printed on the inside of the back cover for easy reference. Also at the back of the book are questions to consider when appraising nursing studies and figures summarizing research designs and statistical tests.

As a learning strategy, chapters are subdivided so that content is presented in manageable "bites." Students commented that they liked this feature. As in previous editions, chapters begin with a complete list of all objectives addressed in the chapter. Objectives are repeated for each subsection and are followed by content, and each subsection ends with the feature Test Your Knowledge multiple-choice and true-or-false questions that include an answer key to reinforce the objectives and content. Chapters also include Critical Thinking Exercises that challenge readers to make decisions based on the content. Users will find significant alterations to the digital resources available to readers.

In our experience, students often fail to take advantage of the learning resources available on Navigate. Sometimes they are unaware that Navigate exists and other times they forget to use it. "Practice With This" is a new feature added to remind students to use the helpful exercises, such as flashcards and quizzes, that are available on Navigate. In addition to the reminders to use Navigate, students are provided prompts to apply content to engage in active learning beyond just reading the text. These prompts can also be used by professors as discussion topics or for minor assignments.

The Apply What You Have Learned feature has been updated with current evidence. For those of you who are new to this textbook, the Apply What You Have Learned feature is found at the end of each chapter. Students are engaged step by step through an EBP project, which can be integrated as a classroom activity or assignment. The topic remains adherence with hand hygiene, because this continues to be a clinical problem involving all healthcare providers in all settings and significantly impacts patient outcomes. Articles are selected to represent a cross-section of evidence, such as RCTs, integrative reviews, EBP summaries, and qualitative designs. Concrete strategies allow readers to master competencies needed to perform EBP activities in the clinical setting.

We often receive feedback about a lack of articles as examples of research. There has always been a list of articles with citations for students to use to easily retrieve the articles. In this edition, to better emphasize these articles and their relevance, two new features have been added. First, descriptions about the articles are embedded into the chapter content. Descriptions from articles are used to illustrate specific points being made in the text. Additionally, a "Note" feature has been added to call attention to when these articles are presented in the text. These same articles are incorporated into both the Practice With This and Apply What You Have Learned features. Providing students a list of article citations reduces costs that would otherwise be passed on to students if these articles were included in the back of the textbook or placed on Navigate. An additional benefit is that as students retrieve the articles, they refine their search skills. The articles included for this edition are shown in the table.

Citation	Chapters	Search Terms
Articles to Search in CINAHL/MEDLINE/ Health Source: Nursing/Academic Edition		
Arvidsson, L., Lindberg, M., Skytt, B., & Lindberg M. (2022). Healthcare professionals' working conditions in relation to risk behaviours for organism transmission: A mixed -methods study. *Clinical Nursing, 31*, 878–894. https://doi .org/ 10.1111/jocn.15940	5, 10	Arvidsson (author) "mixed-methods" (all fields)
Ching, C. W., Harn, E. L. Y., Wen, T. Y., & Xuan, G. Y. (2022). Translating and validating a Bahasa version of hand hygiene questionnaire. *The Malaysian Journal of Nursing, 13*(4), 34–38. https://doi.org/10.31674/mjn.2022.v13i04.006	5, 12	Ching (author) "Bahasa" (all fields)
Croke, L. (2022). Strategies to improve hand hygiene compliance. *AORN, 116*(4), 4–6. http://doi.org/10.1002 /aorn.13800	1, 5	Croke (author) "hand hygiene compliance" (title)

Citation	Chapters	Search Terms
Articles to Search in CINAHL/MEDLINE/ Health Source: Nursing/Academic Edition		
Elia, F., Calzavarini, F., Bianco, P., Vecchietti, R. G., Macor, A. F., D'Orazio, A., Dragonetti, A., D'Alfonso, A., Belletrutti, L., Floris, M., Bert, F., Crupi, V., & Aprà, F. (2022). A nudge intervention to improve hand hygiene compliance in the hospital. *Internal and Emergency Medicine, 17,* 1899–1905. https://doi.org/10.1007/s11739-022-03024-7	2, 5	Elia (author) Calzavarini (author)
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Citation	Chapters	Search Terms
Articles to Search in CINAHL/MEDLINE/ Health Source: Nursing/Academic Edition		
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Resources continue to be available to faculty such as slides in PowerPoint, EBP project assignment instructions with grading rubric, and templates for posters. These resources can be used as presented or adapted as needed. In the past, faculty have indicated that these resources are helpful.

Available in Navigate		
Resource	**Chapter**	
Search Strategy Worksheet PICOT-Style Summary Grid for Students Traditional Summary Grid for Students PICOT-Style Summary Grid for Faculty Traditional Summary Grid for Faculty Instructions and Grading Rubric for PICOT Style Summary Grid	5	Visit this text's accompanying digital resources to find links to these materials.
Policy Format 1 Example Policy Format 1 Template Policy Format 2 Example Policy Format 2 Template	15	Visit this text's accompanying digital resources to find links to these materials.
Poster guidelines for EBP Project Poster templates for EBP Project Grading Rubric for EBP Project Poster Example of Acceptance Letter	19	Visit this text's accompanying digital resources to find links to these materials.

We hope that the variety of strategies incorporated in this textbook will meet your teaching and learning needs, while generating enthusiasm about EBP.

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