

CHAPTER TWO

RESEARCH EVIDENCE

In Chapter 1, reference was made to research evidence, but it was not explained in full. That needs to be done. As a student new to the science of nursing, when mention is made of research evidence, you will naturally think of the findings of a scientific study. However, as you proceed through this course, you will come to see that research evidence can take several forms:

- Findings from a single, original study
- Conclusions from a systematic review of several (or many) studies
- Research-based recommendations of a clinical practice guideline

Types of Research Evidence

Building Knowledge

A finding of an **individual study** is the most basic form of research evidence. Most studies produce several findings, but each finding should be considered as a separate piece of evidence because one finding may be well supported by a study while another finding may be on shaky ground. Although a finding from an original study is the basic building block of scientific knowledge, knowledge is really more like a structure made up of many different kinds of blocks (see Figure 2–1).

Findings from many soundly conducted studies are necessary to build a reliable base of clinical knowledge regarding an issue. Insistence on confirmation of a finding from more than one study ensures that a knowledge

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claim is not just a fluke resulting from the particular patients, setting, or research methods of that one study. If a finding is confirmed in several different studies, clinicians have confidence in that knowledge because it held up across diverse settings, research methods, patient participants, and clinician participants.

There are several recognized ways of combining findings from two or more studies; as a group these methods are called **systematic research reviews**. Findings from systematic research reviews may then be translated into research-based recommendations by expert panels. A group of recommendations is called a *clinical practice guideline*. Although research-based recommendations are not technically research evidence, if they were directly derived from research findings and summaries, many can be considered so for practical purposes. In this chapter, each of these forms of research evidence is introduced briefly in turn. Later in the book, each is considered in depth.

Findings from Individual Studies

Most people think of a research study as involving (1) a large number of “subjects” who are randomly assigned to be in one of several study groups; (2) research environments that are tightly controlled; and (3) data that is meticulously obtained and then analyzed using statistics to produce results. In fact, research with these features is common; however, it is

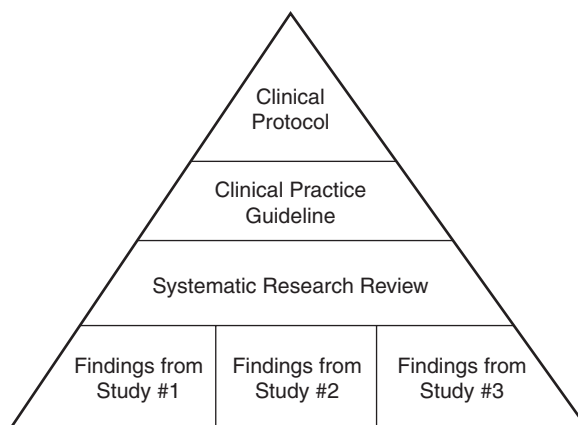


Figure 2–1 Building knowledge for practice.

only one type of scientific study—there are many other kinds of scientifically sound studies. The most common way of thinking about research methods is to categorize them as qualitative and quantitative.

Qualitative Research Studies **Qualitative research** methods are used to study what it is like to have a certain health or health care experience. The experience can be a personal experience such as being a physically disabled parent or being a healthy elder striving to maintain health and an active life. Qualitative research methods are also used to study social settings, social interaction, and social processes. Examples are (1) a study of a social center for persons with chronic mental illness (a subculture setting); (2) a study of how intensive care unit (ICU) staff members interact with family members of unconscious patients (social interaction); and (3) a study of how a family who has entered a family weight loss program makes changes in eating and physical activity over time (social process). These kinds of social situations are typically tangles of issues, forces, perceptions, values, expectations, and aims. They can be understood and sorted out best by a researcher embedding herself in the situation and using methods of inquiry that will get at participants' perceptions, feelings, daily thoughts, beliefs, expectations, and behavior patterns. Data collection methods such as in-depth conversations, diary keeping, extensive interviewing, extended observation, and focus groups are used to acquire insights regarding these subjective realities. The data is analyzed in ways that preserve the meanings the words, phrases, and actions have for the participants.

A research study using these methods is described as qualitative because the researcher does not try to quantify the data. Instead, the researcher attempts to understand the meaning of what the participants have said, determine if there are themes or patterns in experience and meaning across similar participants, and discover if there is a psychological or social process underlying what is happening. In Chapter 4, qualitative research is described in more depth.

Quantitative Research Studies **Quantitative research** methods are also used to understand how the world works. However, numerical measurement is used to explore and confirm the level at which the phenomena are present and the nature of **relationships** among them. I realize I introduced a new word in that last sentence, so a bit of a diversion is needed here because the word is used in research articles. The word *phenomena* (in its plural form) is used throughout the research world as a catchall phrase to describe

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the realities of a field of study. In nursing research, the phenomena of interest (Kim, 2000) include features of the following:

- The client, such as fatigue, anxiety, motivation, nonadherence
- The client's environment, such as social support, noise, and peer group values
- Nursing action, such as empathy, patient teaching, and wound cleansing
- The nurse–patient relationship and communication
- The health care system, such as access to health care, length of stay, quality of care

In brief, nursing phenomena are personal, social, physical, and system realities that exist or occur within the realm with which nursing is concerned.

Getting back to types of research, exploring and confirming relationships between phenomena can be done to a limited extent using qualitative research methods. Many relationships can be explored more extensively when the phenomena are measured quantitatively. For instance, body temperature could be described using the qualitative words *cool*, *warm*, and *hot*, but using the quantitative standard of thermometer degrees is a much more precise and useful way of conveying and tracking body temperature. Moreover, quantifying variables allows exploration of how a change in one relates to a change in another, as when the relationship between body temperature and white blood count is analyzed using a correlation statistic. Quantitative methods are also used to test how well a nursing intervention works compared to another intervention. In intervention studies, the outcomes expected to be produced by the intervention are carefully measured in each patient participant or a determination is made regarding how many patients attained the outcomes of interest.

Study Purpose and Study Method The researcher's decision to use either a qualitative method or a quantitative method is determined by the nature of the question. As just described, qualitative methods yield better understanding for some types of research questions, whereas quantitative methods provide better answers to other questions. Together, qualitative and quantitative methods serve a range of purposes:

- Understand a health, illness, or health care experience
- Develop a theory about responses to an illness condition
- Describe a health-related situation (e.g., mother–infant interaction)

- Measure the strength of relationships between several health-related phenomena (e.g., hours worked outside the home and mother fatigue)
- Test a **hypothesis** about the effectiveness of an intervention

Generally, each of these purposes requires a different research strategy and approach, although researchers sometimes use qualitative and quantitative in combination with one another. Using mixed methods can produce a more complete portrayal of some issues than can one method alone.

Qualitative research methods are generally inductive, meaning researchers produce findings by working from observations to more general statements. They have strategies and plans before they enter the settings in which they will make observations and inquiries, but they are also flexible to follow where their findings take them.

In contrast, quantitative researchers tend to think in terms of choosing a **research design**. A research design is a framework or general guide regarding how to structure studies conducted to answer certain types of research questions. A study design includes the number of populations that will be represented, comparisons that will be made, and the sequence of study activities, such as when observations or measurements are made. The four quantitative research designs used most often in nursing research are (1) **descriptive designs**, (2) **correlation designs**, (3) **experimental designs**, and (4) **quasi-experimental designs** (Burns & Grove, 2005). You will be learning about each of these designs.

Researchers choose the design that will provide the best approach to their research question or purpose and that is feasible given the resources available. Using the design features as a template, they develop a detailed **study design** that spells out specifically how their study will be conducted. A study design includes the following:

- The theoretical framework that will be used (if any)
- Sites and settings that will be involved
- How the sample will be obtained
- Ethical protections that will be put in place
- What information will be provided to participants
- Design of the interventions (if any)
- Measuring instruments that will be used
- The sequence of study activities
- Data collection procedures
- How unwanted influences will be controlled
- How data analysis will be performed

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In summary, the two major categories of research methods used in clinical nursing studies are qualitative and quantitative. Both methodological approaches are needed to provide the full range of knowledge needed by clinical nurses.

Conclusions of Systematic Research Reviews

Systematic research reviews (SRRs) are an important and useful form of research evidence. A systematic research review is a research summary that produces conclusions by bringing together and integrating the findings from all available original studies. The integration of findings from several or many studies can be done using tables and logical reasoning or statistics. The cumulative findings are formulated as new knowledge claims, which are unifications of the separate findings of the original studies. The methods for accomplishing the unification are widely agreed upon and serve to reduce **bias** resulting from the process used to summarize the findings. Systematic research reviews, when well done, bring to light trends and nuances regarding the clinical issue that are not evident in the findings of individual studies. Considerable attention is given to SRRs in Chapter 9, and you will read one. For now, I suggest that you take a look at an abstract of a systematic review. I suggest this because reading and using the conclusions of systematic research reviews is one of the destinations on your learning path.

1. Go online to the PubMed Web site: <http://www.pubmed.gov>.
2. Type the following key words in the search box: *infants pain sucrose Leef 2006*.
3. That should bring up the citation and abstract for a review of 16 studies about oral sucrose administration to decrease pain in newborn infants (Leef, 2006).
4. Note that the abstract provides information about how many articles were included in the review, how many infants were included in the studies, and what was found. Remember: You are reading a short synopsis of the review, not the entire report.

Recommendations of Evidence-Based Clinical Practice Guidelines

The third form of research evidence is the recommendations of an **evidence-based clinical practice guideline (EbCPG)**. An evidence-based clinical guideline consists of a set of specific recommendations for care that

are rooted mainly in research evidence, albeit with some supplementation with expert opinion. They are most often developed by organizations with the resources (money, expertise, time) required to produce them. It might be useful at this point to take a look at one. I suggest the following:

1. Go to the Registered Nurse Association of Ontario (RNAO) Web site: <http://www.rnao.org/>.
2. Click the Nursing Best Practice Guidelines tab, and then follow links to a list of guidelines.
3. Scroll down until you come to the guideline on Smoking Cessation, and then click it.
4. Scroll down to related downloadable links, and click Summary of Recommendations.

The developers of these guidelines looked at the research on smoking cessation and based each recommendation on the best available evidence. The strength of the evidence is indicated in the right column; don't get caught up in that right now, except I will tell you that level A evidence is very strong research evidence whereas level C evidence is expert opinion evidence (i.e., no research exists, so consensus of the expert panel was the best available evidence). Again, remember that you are looking at part of a much larger report. Elsewhere in the report, the research findings on which the recommendations are based are detailed. The recommendations are end products of findings from many research studies. Importantly, they are much more ready-to-go for clinical use than are original research findings themselves—they are the nutritious fast food of evidence-based practice.

Research Evidence

- Findings from individual studies
- Conclusions of systematic research reviews
- Recommendations of evidence-based clinical practice guidelines

Compressing the Time Frame

When engaging in a care improvement project, an agency team first looks for an existing evidence-based clinical practice guideline or a systematic research review. These forms of evidence have the advantage of requiring less work and time on the part of the protocol project team because the

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work of locating, reading, appraising, and summarizing the findings of individual studies has already been done. For time-pressed clinicians, evidence-based clinical practice guidelines and systematic research reviews are the short roads to research-based protocols (see Figure 2–2). They make research-based care possible to an extent that would not be attainable if every protocol project team had to work with original studies—from the ground up, if you will.

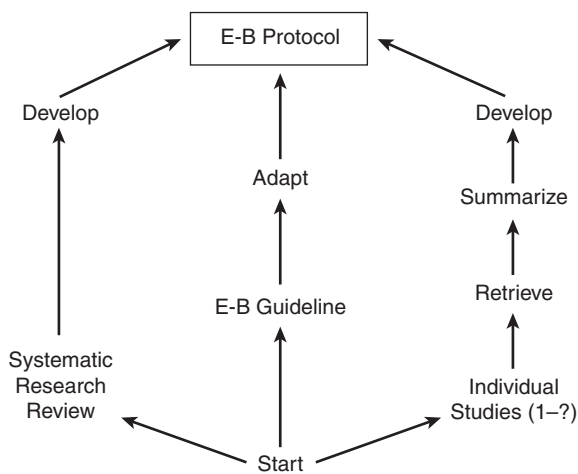


Figure 2–2 Roads to E-B protocols.

Going Forward

In the next chapter, you will learn how to read research reports of individual studies. Then, in Chapters 4 through 8, you will be guided through reading of exemplary articles reporting about five different types of research (one qualitative study and four types of quantitative studies). In Chapter 9, you will read a systematic research review and learn how one type of systematic research review is conducted. And in Chapter 10, you will read a research-based clinical practice guideline and learn how they are produced. Note that this order is the reverse of the order in which care design project teams

actually **search** for research evidence—they first look for research-based guidelines and systematic research reviews. If they exist and are well done, the team can build on them rather than reinventing the wheel. The reason for the reversal in this book is that proceeding from original studies, to systematic research reviews, to evidence-based clinical practice guidelines is a more natural learning order.

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