



part II

Planning for Research

- 4** Finding Problems and Writing Questions
- 5** The Successful Literature Review
- 6** Theoretical Frameworks
- 7** Selecting an Appropriate Research Design

chapter 4

Finding Problems and Writing Questions

CHAPTER OBJECTIVES

The study of this chapter will help the learner to

- Discuss strategies for identifying research problems.
- Describe the process for narrowing a research problem down to a researchable question.
- Define and contrast problem statements and purpose statements.
- Develop and articulate problem statements and purpose statements.
- Perform a critical analysis of the problem statement and purpose statement from a research article.

KEY TERMS

Analytic question	Hypothesis	Prospective studies
Concepts	Inductive	Purpose statements
Correlation studies	Nondirectional hypothesis	Replication studies
Deductive	Null hypothesis	Research question
Directional hypothesis	Problem statements	Retrospective study

Introduction

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

Finding and developing significant problems for nursing research are critical to improving processes and outcomes for patients, nursing staff, and organizations. The

Voices from the Field

The idea for this research study actually had its beginnings when we took a class on critically reading research. We work on a medical–surgical unit, and we decided that we would like to try to do a small project. So we decided to do some observation and find a question to study, even though it is a really busy unit.

About that time, we had a physician who began doing more bariatric surgery. The standing orders for these patients were to have physical and occupational therapy evaluate the patient and get them up and walking. We had always interpreted that as the next morning, because the therapies were generally not available in the evenings when these patients were in shape to start moving. We had patients who wanted to get up and walking the first evening, though, and so we would help them walk. We noticed that these patients seemed to get less nausea. Nausea and retching are important in these patients because we cannot get their intravenous line out until they are not vomiting, and retching is very painful for them. They get their pain meds through the IV, and if they are vomiting we cannot switch to oral meds and pull their IV lines. So if the patient had to wait until the second day to walk, it seemed they had more nausea and vomiting, and it just backlogged everything. It usually meant their discharge was delayed until the evening of the second day. So we wondered if maybe it was the earlier walking that was helping with the nausea.

So we started with a literature search. Originally, we planned to find a study and replicate it; we really never thought we could do a study of our own. We just wanted to duplicate what someone else had done. But there were no studies to be found. We found lots of studies of the effects of ambulation in the postoperative period, but nothing with this specific group of patients, and none of the studies measured nausea as the outcome measure. So we thought, “Maybe we need to do a study.” We were going to do something very simple, not even go through the institutional review board (IRB), more like a quality study. We were nervous about having to go to the IRB; we thought that would be way too deep for us. We thought a little study would be a good way, a really simple way for the staff to be involved in research, and we thought it was doable.

We had an opportunity to consult a researcher through our evidence-based practice council. The researcher told us, “This is a good study; this is publishable,” and that was a turning point for us. We realized that this was as important as what other nurse researchers studied, and that we had an opportunity to make a contribution to practice.

What started as a simple little question—does walking affect nausea?—has evolved into something more complicated. Our research question is now based on time—in other words, how soon does the patient have to walk to get a benefit? The process kind of forced us to produce criteria for when a patient is ready to walk, and that was a conversation that the whole staff participated in. We introduced another element after consulting with physical therapy. We now have one group that will use a bedside pedaler and one that will walk, and we will see if there is an advantage of one over the other. That would be helpful to know, because when we have really chaotic days, we may not have a lot of time to stop and walk someone. If we can find that the pedaler does get that gut waking up faster, then we can use it, because it takes much less time.

When the people on the unit realized that our goal was publication, then they were on board. We have learned to appreciate the nurses we work with who have stayed in medical–surgical nursing. One of the driving things behind this is to gain some respect for the fact that we are a highly qualified group of nurses who care deeply about patient care and doing the right thing for patients. Taking our nursing practice to the next level, this could be a real source of pride for the staff. And we think that is why they are so behind it.

It has helped us to look at our whole nursing practice and realize it is not insignificant, that this is something someone would want to read. Now that we have finished the IRB process, we've realized, yeah, we really can do that.

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evolution of a research problem from a general topic of interest to the articulation of a problem statement and a purpose statement serves to narrow the focus of the research into a researchable question. This progression moves the research problem from the conceptual (abstract concepts) to the operational (measurable concepts or variables). **FIGURE 4.1** depicts how the individual steps in translating a problem into a researchable question follow this continuum from conceptual to operational.

The traditional method for finding and developing research problems suggests a **deductive**, sequential process from a general interest to the development of a research question. **FIGURE 4.2** demonstrates how the individual steps might look in the development of a specific researchable question.

In truth, the process for finding and developing research problems can be as chaotic as a busy parking lot. Some motorists drive their cars headfirst into the spaces, some motorists back their cars into the spaces, yet other motorists drive their cars into and out of the spaces until their cars are properly positioned. It is similar for research question development. Some researchers do, indeed, use a sequential set of steps to arrive at a specific and well-articulated question. But many nurse researchers also use nontraditional methods for finding and developing research problems. These processes may be more **inductive**, in which specific observations are the starting points, leading to a general focus or interest. **FIGURE 4.3** demonstrates a nontraditional example of finding and developing a research problem. Still other methods may begin somewhere in the middle of the traditional process by recognizing a gap, and proceed to identify the big picture as well as the specific research question.

Regardless of the approach—deductive, inductive, or somewhere in between—finding and developing research problems may be a process best characterized as a work in progress, with the potential for false starts, rethinking, and ongoing refinement as researchers strive to meet the rigors of traditional research methods. In any case, the goal is to narrow the focus of the research problem so that a feasible research question emerges.

Deductive: A process of reasoning from a general theory to a specific and well-articulated question.

Inductive: A process of reasoning from specific observations to broader generalizations and theories.

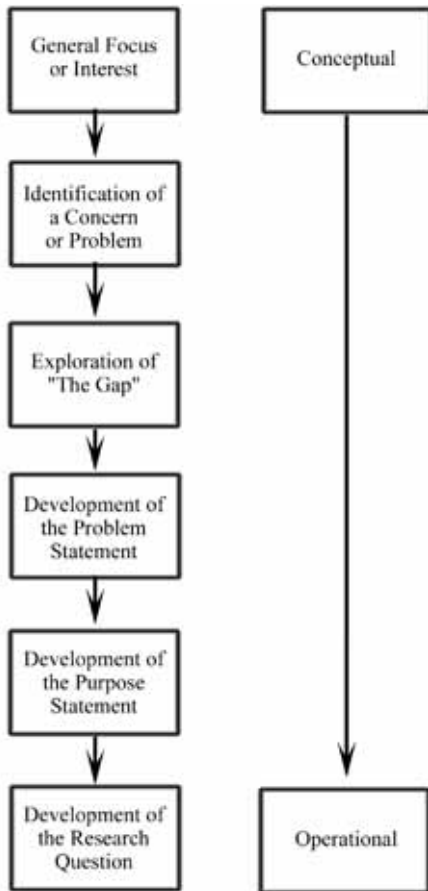


FIGURE 4.1 Traditional Evolution of the Research Process

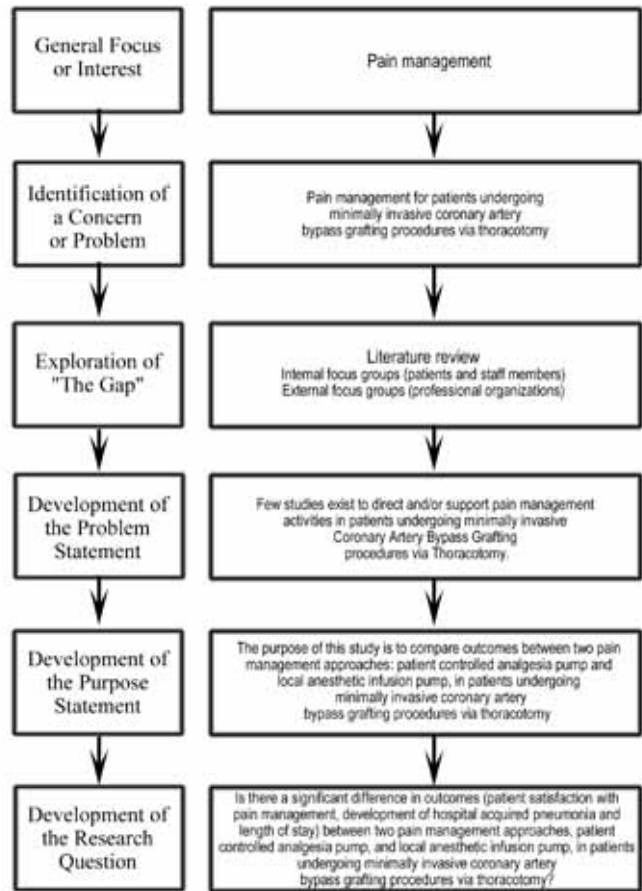


FIGURE 4.2 Example of a Traditional Evolution of the Problem

Concepts: Abstract ideas or topics of interest that must be narrowed to researchable questions to be investigated.

The importance of narrowing the focus of the research cannot be overstressed. Research problems that have not been narrowed generate too many **concepts** and relationships to test.

Subjects or topics that are too broad become problematic for researchers because methodological complexities increase, expert methodologists are required, and resource demands (for example, money, people, and time) increase. With every additional concept and/or associated relationship examined, the feasibility of the study may be affected. The primary objective of nursing research is to increase knowledge to improve nursing practice. This will only be accomplished if the research is actually completed! Some researchers spend a lifetime studying a single concept; others spend their careers completing multiple, small studies. There is no shame in starting, or staying, small. Narrow questions are far easier for the novice researcher to address and may help the nurse learn skills that contribute to larger, more complex

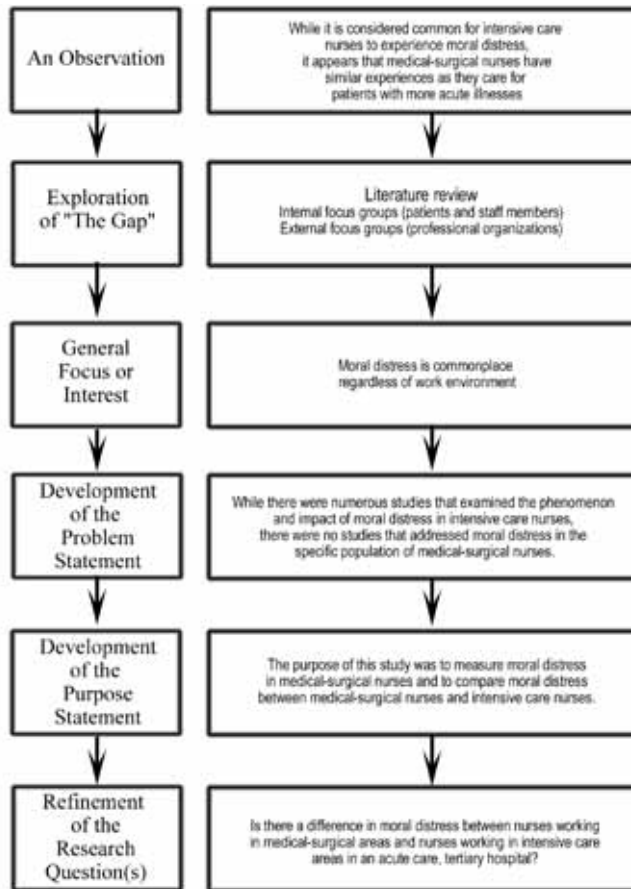


FIGURE 4.3 Nontraditional Example of the Evolution of a Research Problem

studies. **Table 4.1** demonstrates the narrowing of a research problem from the broad topic of “failure to rescue” to some narrower, researchable concepts associated with “rapid response teams.”

As the research problem moves from a broad topic of interest to a narrowed, researchable question, measurable variables and outcomes become evident. It is paramount that consideration be given to the type of concept under investigation. Concepts may represent many things; however, they roughly fall into three categories: patient sensitive, staff member sensitive, or organizationally sensitive. Categorizing a concept is directly related to the type of process or outcome measured. Concepts studied by nurses, especially novice nurse researchers, should be limited to concepts within the nursing span of control. For example, a nurse interested in the development and severity of hematomas at arterial access sites after diagnostic or interventional coronary arteriography would be better suited to ask research questions about positioning and turning the patient, rather than questions about the method of arterial access used for the procedure. The first research question identifies nurse-sensitive concepts (repositioning and/or turning)

Table 4.1

Researchable Concepts for Failure to Rescue

Criteria

- Acute renal failure
- Acute ulcer: gastrointestinal hemorrhage
- Cardiac arrest
- Deep vein thrombosis
- Pneumonia
- Pulmonary embolism
- Sepsis
- Shock

Factors

- Patient characteristics
- Staffing effects
- Organizational resources

Process

- Bed management and patient placement
- Rapid response teams

Cardiopulmonary Events

- Impact on total number
- Impact on number on the medical–surgical patient care areas
- Impact on number on the intensive care units
- Impact on survivability to discharge

Table 4.2

Examples of Patient, Nursing, and Organizationally Sensitive Concepts

Patient-Sensitive Concepts	Nurse-Sensitive Concepts	Organizationally Sensitive Concepts
Anxiety	Burnout	Cost
Depression	Immobility-related injuries	Length of stay
Functional independence	Medication errors	Readmission
Blood glucose	Pain management	Resource utilization
Blood pressure	Patient falls	Satisfaction with nursing care
Quality of life	Restraint prevalence	
Satisfaction with nursing care		

whereas the second research question identifies medically sensitive concepts (arterial access methods). **Table 4.2** provides examples of each of these kinds of concepts. This is not to say that nurses should not participate in research that examines concepts outside the traditional nursing domain; however, if the main purpose of nursing research is to

increase the body of nursing knowledge, it is logical to study concepts as they relate to nurse-sensitive topics.

Finding and Developing Research Problems

Often, research problems find the nurse rather than the other way around. Frustrations with ineffective procedures, the search for a “better way,” or the need to help a single patient may motivate the nurse to seek research-based evidence to improve patient care. The search for research problems is one of the easiest parts of the research process; researchable problems virtually surround the contemporary nurse in practice.

Sources of Research Problems

Researchable problems can come from a virtually unlimited number of sources (Burns & Grove, 2008; Polit & Beck, 2009). The following are some sources for researchable problems:

- Clinical practice observations
- Educational experiences
- Patient feedback
- Theoretical models and frameworks
- Professional literature
- Performance improvement studies
- Research reports and priorities
- Social issues

Clinical Practice

Research problems may be generated from active, passive, or other organizational activities. Active methods include experiences with direct patient care and discussion with other members of the health-care team through formal (interdisciplinary work teams) or informal (shift report) communications. Patient problems, ineffective clinical procedures, or changes in protocols all present opportunities for research. Passive methods for identifying problems include medical record review and observation. Other methods include data collection activities such as those performed for quality improvement or risk management.

Educational Experience

Research problems may be generated from educational experiences. Nursing students taking research courses are required to develop problem, purpose, and research statements from required and/or self-determined topics. Educational institutions that are research-focused may have specified research activities examining interests such as age-specific care, the effects of caring, or nursing shortage outcomes. Within the assignments and disciplined inquiry that occur during the educational experience, particularly graduate study, nursing students and their mentors generate many researchable problems.

gray matter

Three categories of nursing research concepts are those that are

- Patient sensitive
- Staff member sensitive
- Organizationally sensitive

Consumer Feedback

Research problems may be generated from the results of activities aimed at soliciting patient feedback. Feedback may be solicited from the following sources:

- Patients and customers of the institution, both external and internal
- Leaders that represent the interests of specific services (for example, cardiac care)
- Departments (for example, the coronary care unit) and service lines (for example, cardiac services) within an organizational structure
- Advisory boards and other consumer input organizations
- Members of general or specialty professional organizations (for example, the American Nurses Association or the American Association of Critical Care Nurses)

The feedback that is garnered from these groups may generate problem statements, purpose statements, and research questions, as well as priorities for performance improvement or other research activities. Feedback may be solicited via survey, from formal and informal meetings, and at conferences and workshops, or it may be received electronically.

Theoretical Models and Frameworks

Research problems may be generated from the development and testing of concepts and their associated relationships within conceptual models and theoretical frameworks. Basic research focuses on the testing of theories, and models involve the testing of relationships, effects, and interactions. Models and frameworks may be originated by the researcher or retrieved from the literature for further study.

Professional Literature

Research problems may be generated from the results of professional literature reviews. Sources of professional literature review include clinical and nonclinical works, databases, and letters and opinions. Clinical works include books and journals representing nursing and medical topics, both general and specialty. Nonclinical works include books and journals representing nonnursing and nonmedical topics from other fields of study that may be generalized into an appropriate, researchable problem to expand nursing knowledge. Many databases, clinical and nonclinical, are capable of provoking inquiry. Examples of these databases include those that hold data from previous studies (clinical) and census data (nonclinical). Many research problems have been developed by using the data collected by other researchers and taking a unique approach to the analysis. Published letters and opinions are an interesting source of research problems. Letters and opinions written by nurses and other medical professionals often express concern, as well as directives, about researchable problems, gaps in current knowledge, limitations of available research, and recommendations for future research.

Performance Improvement Activities

Performance improvement activities, also known as quality improvement activities, are used to improve processes and outcomes and to meet regulatory requirements. Tools and techniques specific to performance improvement do not meet the requirements of traditional research methods. Performance improvement studies are often characterized by methodological limitations, a lack of control over extraneous variables, violation of

assumptions for statistical testing, and small sample sizes in a single setting; all affect the generalizability of the findings. However, the results of performance improvement activities may be used as a springboard into formal research activities. Researchable problems may start as performance improvement activities and expand into formal research projects with alterations in methodological approach, sampling strategy, and informed consent procedures.

Research Reports and Priorities

Research problems may be generated from the outcomes of other research studies and evidence-based practice reviews. Previous research may directly or indirectly influence the generation of research problems. A conventional part of a research report is a section on “suggestions for future research,” which outlines ways to extend and expand on the currently available research. Researchers may directly influence the generation of subsequent research problems by explicitly stating remaining problems, gaps, and questions. A common form of direct influence is the type of research known as the **replication study**. Replication studies may be used to validate findings and knowledge, increase generalizability (population and setting), and/or eliminate or minimize limitations (methodology). Replication studies are good exercises because they are a means of increasing the knowledge of inexperienced researchers. Research also may indirectly influence the generation of a problem when the reader identifies a problem with the written report (discrepancy, gap, inconsistency, or unidentified limitation) or disagrees with the methodology and/or results of the original investigator.

Replication studies: Studies generated from previous research studies in which the research is reproduced to validate findings, increase generalizability, and/or eliminate or minimize limitations.

Research problems may also be generated from the directives and recommendations of individuals and organizations. Because of expertise, individuals (educators and researchers) and organizations (clinical, educational, funding, and regulatory) have identified problems and gaps in current knowledge. Some of these experts have developed problem statements and research questions to prioritize future research.

Social Issues

Research problems may be generated from social issues. Social issues include, but are not limited to, the effects of age, culture, education, gender, income, race, religion, and sexual preference. Social issues may be examined in the context of current events, the environment, and health policy. Social issues may also be examined as they affect local, state, national, or international populations.

This list of sources for research problems is not exhaustive nor is it mutually exclusive. Research problems are often the product of both internal and external driving forces; they are seldom generated from a single source. Any process or outcome associated with patient care, staff member work environment, or organizational success may become the basis for study. The potential nurse researcher can scrutinize the current practices and ask the following questions:

- Why are we doing it this way?
- Is there a better way of doing it?
- Should we be doing it at all?

All these questions may give rise to researchable problems, the solutions to which may add valuable evidence to the effective practice of nursing.

Problem statements: Statements of the disparity between what is known and what needs to be known and addressed by the research.

Articulation of Research Problem Statements

Research **problem statements** are declarations of disparity: the difference (gap) between what is known and what needs to be known about a topic. They articulate a discrepancy that is to be addressed by the research process. The disparity, whether a small gap or a large chasm, defines the area(s) of concern and focuses the research methods (Burns & Grove, 2008; Polit & Beck, 2009). Most problem statements are explicitly stated; however, some problem statements may be inferred. The inferred research problem statement may describe the importance and/or potential consequences of the disparity as it pertains to clinical practice.

Problem statements, explicitly stated or inferred, are usually located at the beginning of a research report, in the introduction, and/or in the review of literature, and may be repeated throughout the written report. The idea of a single problem statement is misleading; problem statements may resemble problem paragraphs, and often can be several sentences long. Problem statements are written as questions or statements, and well-written ones contain clear, concise, and well-defined components. An example of a well-written problem statement from a published article follows:

Literature about adaptation to caesarean birthing is rooted in the experiences of women in the last three decades of the 20th century and may not inform care of contemporary caesarean-delivered women. Research findings document both normal and negative psychological outcomes. Although most research has focused on unplanned caesarean birth, elective planned caesarean is increasing in popularity. Postpartum care studies are limited to needs during hospitalization. Evidence about the needs of women in the immediate post-hospitalization period is lacking. (Weiss, Fawcett, & Aber, 2009)

Purpose statements: Declarative and objective statements that indicate the general goal of the study and often describe the direction of the inquiry.

Development of Research Purpose Statements

Whereas research problem statements identify a gap in knowledge that requires disciplined study, research **purpose statements** are declarations of intent. Purpose statements indicate the general goal of the study and often describe the direction of inquiry (Burns & Grove, 2008; Polit & Beck, 2009). The purpose of the research should be clearly stated. Purpose statements are written as objective statements. They are easily identified in reports because of words such as *aim*, *goal*, *intent*, *objective*, or *purpose*. They contain clear, concise, and well-defined components including key variables to be studied, their possible interrelationships, and the nature of the population of interest. An example follows of a purpose statement from a published study:

The purpose of this study is to address gaps in knowledge about adaptation to planned and unplanned cesarean birth. The study will identify post-discharge needs and relevant nursing interventions. (Weiss et al., 2009)

This purpose statement indicated the methods used to examine the concepts (descriptive study), the variable of interest (adaptations, needs, and interventions), and the specific population (mothers experiencing cesarean birth).

Although many of these processes have been reviewed for quantitative studies, problem and purpose statements are not limited to research based on empirical measurement. Qualitative studies use subjective means to describe and examine concepts and their meanings but will still have an identifiable problem focus and purpose statement. The problem and purpose statements of qualitative studies may be more vague and less prescriptive than those for quantitative studies. This is primarily due to the emergent nature of research design in qualitative research. Although an overall problem is generally identified for a qualitative study, the purpose may be broader and less detailed than that of a quantitative study because the particulars of the study may only be clear after data collection has commenced. Quantitative studies, by nature, are more prescriptive and use objective measures to describe and examine concepts and the relationships between concepts. The problem and purpose statements for quantitative studies should be detailed and objective. **Table 4.3** outlines the most common components of research problem and purpose statements.

Researcher bias is a limitation that may cause readers to question the validity of research processes and outcomes. When developing purpose statements, researchers should use unbiased verbs such as *compare*, *describe*, *develop*, *discover*, *explore*, *test*, and *understand* and avoid biased verbs such as *demonstrate*, *prove*, and *show*.



Research Methods and Examples of Purpose Statement Verbs

Qualitative Methods

Ethnographic

- Assess
- Describe
- Examine
- Understand

Grounded Theory

- Develop
- Extend
- Identify
- Validate

Phenomenological

- Describe
- Develop
- Generate
- Understand

Quantitative Methods

Correlation

- Determine
- Examine
- Identify
- Understand

Descriptive

- Compare
- Contrast
- Describe
- Identify

Experimental

- Determine
- Examine
- Investigate
- Measure

Table 4.3

Problem Statement and Purpose Statement Components

Problem Statement Components	Purpose Statement Components
<ul style="list-style-type: none"> ■ Description of the disparity or gap in knowledge ■ Concepts that are part of the problem 	<ul style="list-style-type: none"> ■ Design of the study ■ Variables to be studied ■ Population to be included ■ Setting of the study

- *Example of using an unbiased verb:* The purpose of the study was to explore the effects of music therapy on speech recovery in adult stroke patients in a rehabilitation facility.
- *Example of using a biased verb:* The purpose of the study was to prove that music therapy improves speech recovery in adult stroke patients in a rehabilitation facility.

Carefully writing the purpose statement is the first step in demonstrating its appropriateness for study. Thoughtful inspection of the purpose statement for its feasibility and fit with the researcher's needs is worth the time. Although a purpose statement is relatively easy to compose, completing a study is a time-intensive, arduous process. It should be undertaken only when the researcher has a reasonable expectation of successfully achieving the purpose as stated.

Feasibility of the Purpose Statement

Purpose statements serve to refine the scope of the research, support problem statements, and clarify the significance of the research for the reader. They should be feasible to study, however, within the interests, resources, and capabilities of the nurse researcher (Burns & Grove, 2008; Polit & Beck, 2009). One way to analyze feasibility is to conduct a SWOT analysis. SWOT stands for strengths, weaknesses, opportunities, and threats, and it can serve as a systematic way to assess the overall practical feasibility of the purpose statement. A SWOT analysis is performed by evaluating the following considerations:

- Required resources in terms of time, money, equipment, and people
- Ethical considerations of the design
- Specific variables to be studied
- Availability of the population of interest
- Potential access to the setting of the research study

Performing a SWOT analysis will indicate whether the research study is feasible as articulated by the purpose statement. Research purpose statements that fail SWOT analysis and are determined to be nonresearchable because of resource or ethical issues require the researcher to either revise the statement or look at the research problem in a different way.

Fit of the Purpose Statement

Research purpose statements indicate how variables will be studied within specific populations and settings. There should be a good fit between the design suggested in the purpose statement and the methods used in the research study (Burns & Grove, 2008; Polit & Beck, 2009). Two examples follow of potential purpose statements for a quantitative, correlation design:

- The purpose of the study was to determine the direction and strength of the relationship between depression and functional independence in patients at an urban rehabilitation center.
- The purpose of the study was to measure the effects of depression on functional independence in patients at an urban rehabilitation center.

The purpose statement in the first example exemplifies a good fit between the purpose statement and the study methods. Correlation methods measure the direction and strength of a relationship; they are not appropriate for assessing cause and effect. The purpose statement in the second example does not have a good fit with this method because this statement indicates the researchers intend to determine a causal relationship between the variables. Example 2 would be better served with a quantitative, experimental design.

Differentiating Research Problem Statements and Research Purpose Statements

Research problem statements are declarations of disparity (why); research purpose statements are declarations of intent (what). Although problem statements and purpose statements clarify and support each other, they represent different levels of the deductive process, the process of moving from a general focus or interest to the development of a specific research question. As researchers identify problems, explore disparities or gaps, and develop problem and purpose statements, the focus of the research narrows, increasing feasibility.

Although problem and purpose statements for quantitative and qualitative research have many characteristics in common, they have some dissimilarity as well. Quantitative problem and purpose statements are generally detailed, based in previous literature, and outline the variables, populations, and settings to be studied (Burns & Grove, 2008; Polit & Beck, 2009). Qualitative problem and purpose statements are more general and allow for the flexibility that is characteristic of an emergent design (Burns & Grove, 2008; Polit & Beck, 2009). It remains important for a clear problem to be identified and a purpose statement to be articulated before research design begins. **Tables 4.4** and **4.5** provide examples of problem and purpose statements for selected qualitative and quantitative research designs.

Developing the Research Question

The problem statement is a general review of why a particular research study is necessary; the purpose statement gives an overview of the intent of the study. Neither of these is

Table 4.4

Problem and Purpose Statements from Qualitative Research Studies

Design	General Focus or Interest	Problem and Purpose Statements
Ethnography	<ul style="list-style-type: none"> ■ Culture ■ Empirical research report ■ Experiences ■ Nursing ■ Patient-centered care ■ Patients ■ Trauma 	<p>Title: Professional Nursing Culture on a Trauma Unit: Experiences of Patients and Staff (Tutton, Seers, & Langstaff, 2008)</p> <p>Problem Statement: “For many patients, a traumatic event that leads to hospitalization has a major effect on their lives. . . . Hospitalization, although only a small part of recovery, has the potential to lay the foundations for future health and well-being. Therefore, it is important to understand the processes that facilitate or hamper patients’ progress towards recovery” (p. 146).</p> <p>Purpose Statement: “The aim of the study was to explore patient and staff experiences of being on a trauma unit” (p. 146).</p>
Grounded theory	<ul style="list-style-type: none"> ■ Community ■ District nursing ■ Dying patients ■ Emotional support ■ Palliative care 	<p>Title: Bridging Worlds: Meeting the Emotional Needs of Dying Patients (Law, 2009)</p> <p>Problem Statement: “In this study, it is acknowledged that nurses do provide supportive interventions but few studies have examined specifically the emotional aspects of nursing care” (p. 2632).</p> <p>Purpose Statement: “The aim of this study was to develop a grounded theory to explain how district nurses meet the emotional needs of dying patients in the community” (p. 2632).</p>
Phenomenological	<ul style="list-style-type: none"> ■ Access to health care ■ Homeless health care ■ Qualitative study 	<p>Title: Experiences of Homeless People in the Health Care Delivery System: A Descriptive Phenomenological Study (Martins, 2008)</p> <p>Problem Statement: “This qualitative literature review shows growing data about the health problems of homeless people and issues of access to care; little is known about the experience of being ill while homeless and the experience of receiving health care services from the perspective of homeless people, particularly in the United States” (p. 432).</p> <p>Purpose Statement: “This qualitative study looked at the health care experience through the eyes of the homeless person using descriptive phenomenology, a valuable method for nursing research” (p. 432).</p>

Research question: A question that outlines the primary components that will be studied and guides the design and methodology of the study.

prescriptive enough to give specific guidance to the design and methodology of the study. For this, a focused research question is necessary. The **research question** is the final step prior to beginning research design, and it outlines the primary components that will be studied. In some cases, the research question is analogous to the purpose statement, but constructed as a question instead of a statement. Questions that are clear, simple, and straightforward provide direction for subsequent design decisions and enable the researcher to focus the research process. Examples follow of research questions from a published study:

1. What are the learning needs of women with cesarean birth in the two weeks following hospital discharge?

Table 4.5

Problem and Purpose Statements from Quantitative Research Studies

Design	General Focus or Interest	Problem and Purpose Statements
Correlation	<ul style="list-style-type: none"> ■ Self-esteem ■ Stress ■ Coping ■ Eating behavior ■ Depressive mood ■ Adolescent 	<p>Title: The Relationships Among Self-Esteem, Stress, Coping, Eating Behavior, and Depressive Mood in Adolescents (Martyn-Nemeth, Penckofer, Gulanick, Velsor-Friedrich, & Bryant, 2009)</p> <p>Problem Statement: “The relationships among self-esteem, stress, social support, coping, eating behavior, and depressive mood have not been examined simultaneously, nor has coping been examined as a mediator of this process” (p. 97).</p> <p>Purpose Statement: “The purpose of this study was to investigate relationships among self-esteem, stress, social support, and coping, and to test a model of their effects on unhealthy eating behavior and depressive mood in adolescents” (p. 97).</p>
Descriptive	<ul style="list-style-type: none"> ■ Clinical effectiveness ■ Evidence-based practice ■ Institutional culture ■ Management ■ Nursing ■ Organizational context ■ Questionnaire 	<p>Title: Nurses’ Perceptions of Evidence-Based Nursing Practice (Koehn & Lehman, 2008)</p> <p>Problem Statement: “Recent literature has reported substantial gaps between research and nursing practice . . . and has identified barriers that prevent the translation of evidence to clinical practice. . . . Only a few studies have examined the impact of organizational culture or context on the process of implementing EBP. . . . As there is also limited research on appropriate strategies for implementing EBP . . . it is best to consider using an active approach with multiple methods. Thus, it would be prudent to consider the characteristics and perceptions of nurses within an organization prior to developing an implementation plan” (p. 210).</p> <p>Purpose Statement: “The aim of this study was to investigate Registered Nurses’ (RNs’) perceptions, attitudes, and knowledge/skills associated with EBP” (p. 210).</p>
Experimental	<ul style="list-style-type: none"> ■ Nursing practice ■ Nursing practice environment ■ Patient comfort rounds ■ Patient satisfaction ■ Pilot study 	<p>Title: Measuring the Effect of Patient Comfort Rounds on Practice Environment and Patient Satisfaction: A Pilot Study (Gardner, Woollett, Daly, & Richardson, 2009)</p> <p>Problem Statement: “Interventions involving 1- or 2-hourly nursing care rounds have been tested in pilot studies and larger studies and have been found to reduce call bell usage and improve patient safety and reported satisfaction. The specific concept of patient comfort rounds . . . has not been systematically trialed” (p. 288).</p> <p>Purpose Statement: “The aim of this pilot study was to test the effect of a model of practice that optimized the role of the assistant in nursing (AIN) in skill mix” (p. 288).</p>

2. What are the physical needs of women with cesarean birth in the two weeks following discharge?
3. What nursing interventions can help mothers attain optimal health in the post-discharge period after cesarean birth? (Weiss et al., 2009, p. 2941)

As questions are refined, they should be critiqued continuously. The simple act of writing the question down and asking for input from colleagues may help to focus and refine the question. Does it make sense? Is it logical? Is this question important for clinical care? Could there be practical benefits from this research? This kind of feedback can help the nurse researcher generate a strong research question that provides guidance for subsequent research design and methodology. The time invested in carefully constructing the final research question is well worth the effort; it provides a foundation for the remaining decisions that must be made about the research process.

The Elements of a Good Research Question

Two guides are helpful in developing a good research question. One of them is described by the acronym *PICO*, which outlines the elements of a good quantitative question. *PICO* stands for population, intervention, comparison, and outcome. Using preoperative education for short-stay patients undergoing prostatectomy as an example, a research question based on *PICO* might look like this:

- *Population*: In radical prostatectomy patients staying in the hospital one day after surgery . . .
- *Intervention*: Does customized preoperative teaching . . .
- *Comparison*: Compared to standard preoperative teaching . . .
- *Outcomes*: Lead to better pain control as measured by a visual analog scale?

The qualitative research question is less prescriptive and outlines, in a general way, the phenomenon to be studied and the people who can best inform the question. The researcher defines the general boundaries of the inquiry, but even these are subject to change. The study is begun with a general question in mind, but the researcher is flexible enough to change the particulars of the question if the information that is gathered makes it relevant to do so. Measurements, interventions, and comparison groups are irrelevant in qualitative research, and so are not parts of the qualitative question. Specification of outcomes may be incorporated into the qualitative question, but are not necessary elements. Qualitative questions may actually evolve over the course of the study, and so are reported in detail only after the study is complete.

It can be seen that the elements of the research question are very similar to those in the purpose statement. The primary distinction is in format—a purpose statement is a statement, whereas a research question is stated as a question. In addition, the research question often spells out the outcome in a statement such as “as measured by the Wong Faces Pain Scale,” and so gives more specificity to what is to be measured.

Another acronym—the *FINER* model—gives guidance in the appraisal of a question. It gives the nurse researcher a framework for evaluating the desirable characteristics of a good question:

- *Feasible*: Adequate subjects, technical expertise, time, and money are available; the scope is narrow enough for study.
- *Interesting*: The question is interesting to the investigator.

- *Novel*: The study confirms or refutes previous finding, or provides new findings.
- *Ethical*: The study cannot cause unacceptable risk to participants and does not invade privacy.
- *Relevant*: The question is relevant to scientific knowledge, clinical and health policy, or future research directions.

Once the question is carefully defined, then the link to design elements often becomes obvious. If not, then the question may require more specificity about the population, intervention, or outcomes. These three elements of the question will later provide guidance in the selection of a sample, the procedures, and the measurements.

The Link Between Questions and Design

As the research question is focused, it will guide how the question will be answered. The question will lead to a sampling strategy (Who is the patient population?), an intervention protocol (What treatment is being tested?), and the outcomes measured (How will effect be demonstrated?) There are also direct links between the kind of words used in the question and the design that is used to answer it.

Descriptive Questions

Descriptive questions ask simple questions about what is happening in a defined population or situation. For example, a descriptive question is, “What are the characteristics of surgical patients reporting high satisfaction with pain management during their hospitalization?” Sometimes a descriptive study is called a hypothesis-generating study, as opposed to hypothesis-testing studies. Three general research questions are best answered with descriptive studies:

1. Studies that investigate resource allocation
2. Studies that identify areas for further research
3. Studies that provide informal diagnostic information

Most qualitative questions are answered with descriptive studies because qualitative study is generally descriptive of a single sample. The broad nature of a qualitative research question lends itself to a variety of methods, from interviews to focus groups to observation. The specific verbiage used in the qualitative question may guide design, but in general, the design emerges from the nature of the phenomenon under study, not the particular way in which the research question is written.

Analytic Questions

Analytic studies compare one or more interventions to specific outcomes. For example, the questions “What is the effectiveness of individual or group educational sessions for hip surgery patients?” and “Is breast cancer associated with high fat intake?” are answered with quantitative analysis. The objective of an analytic study is to see if there is a causal relationship between variables, so the research question reflects study of the effect of an intervention on one or more outcomes. Statistical procedures are used to see if a relationship would likely have occurred by chance alone. Analytic studies usually compare two or more groups.

Analytic question: A type of research question that is posed to compare one or more interventions to specific outcomes.

Correlation studies: Research designed to quantify the strength and the direction of the relationship of two variables in a single subject or the relationship between a single variable in two samples.

Prospective studies: Studies planned by the researcher for collection of primary data for the specific research and implemented in the future.

Retrospective study: A study conducted using data that have already been collected about events that have already happened. These secondary data were originally collected for a purpose other than the current research.

Analytic questions are not limited to prospective studies, however. Comparison studies—sometimes called contemporary comparison, causal comparison, or retrospective studies—investigate the differences between groups that are formed based on the presence or absence of a shared characteristic. A question that reflects studying two groups for similarities or differences in specified characteristics is answered with comparison studies. The question “What are the differences in symptoms of myocardial infarction between men and women?” is answered with a comparison study. Comparison studies are needed when the research question is focused on a variable that cannot be practically or ethically manipulated, such as exposure to a risk factor or the diagnosis of a specific disease.

Questions that focus on associations or relationships are generally answered with **correlation studies**. Technically classified as descriptive studies, correlation studies focus on the relationships between two variables in the same population (for example, height and weight) or between the same variable in two populations (for example, the height of fathers and sons). Research questions focused on predicting one variable given the presence of another (for example, Can the height of the son be predicted if we know the height of the father?) are answered with a type of correlation study called a regression analysis.

Questions that are written in future tense will be answered with **prospective studies**. Interventions, data collection, and outcomes happen after subjects are enrolled. Examples of prospective studies are clinical trials and cohort studies.

Prospective studies are indicated by research questions that focus on conditions that occur often and with relatively short follow-up periods. These two criteria are necessary so that sufficient numbers of eligible individuals can be followed for a reasonable period of time.

If a research question is written in past tense, it will be a **retrospective study**. All events of interest have already occurred and data are generated from records of the past (secondary data) or by asking subjects to recall events. Retrospective studies are less expensive than

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Some Well-Done Questions

Zayac and Finch (2009) had several questions they wanted to answer in their review of the literature regarding adaptations required of recipients of implanted cardioverter-defibrillators (ICDs). Instead of constructing a complex, multi-concept question, they relied on simpler questions that were direct and descriptive: Do recipients of ICDs experience physical adaptation stress? Do recipients of ICDs experience psychological adaptation stress? Do themes expressed indicate a need for interventions that could facilitate postimplantation adjustment? Note that these authors made explicit the phenomenon of interest (adaptation) and the population (patients with ICDs).

Zayac, S., & Finch, N. (2009). Recipients of implanted cardioverter-defibrillators actual and perceived adaptation: A review of the literature. *Journal of the American Academy of Nurse Practitioners*, 21(10), 549–556.

prospective studies and are often good starting points for exploratory research questions. Retrospective studies are far more effective when the research question involves a rare event because patient records of rare events are generally available even when there are few subjects to recruit.

Analytic studies are logical for questions answered with numbers or with measurements. These quantitative studies involve testing research questions using statistical analysis. Although research questions are not directly testable with numbers, their transformed version—the hypothesis—is subject to numerical analysis. It is important, then, to translate quantitative research questions into hypothesis statements that lend themselves to statistical analysis.

From Question to Hypothesis

Just as the research question guides the design of a study, the **hypothesis** guides the statistical analysis. The way a hypothesis is written will determine what tests are run, what outcome is expected, and how conservative the results are. A hypothesis is a restatement of the research question in a form that can be analyzed statistically for significance. For example, the research question “What is the association of environmental factors and reactive airway disease in otherwise healthy adults?” can be rewritten as a hypothesis as “There is no association between environmental factors and reactive airway disease in otherwise healthy adults.” Although stating there is no expected relationship might seem a counterintuitive way to start a research analysis, it is, in fact, the only way that statistical significance can be measured. Although we cannot ever be sure that a relationship exists, we can calculate the probability it does not. Testing a null hypothesis in effect tells us how much uncertainty there is in the statistical conclusions, so the researcher can judge if it is within an acceptable range.

There are two aspects that make a good hypothesis: the statement of an expected relationship (or, the lack of a relationship) and an identified direction of interest. A **null hypothesis** states there is no difference between groups whereas an alternative hypothesis would specify an expected difference between groups. In either case, the relationship between variables is defined. A second consideration is directionality. A **nondirectional hypothesis** is one that means the researcher is interested in a change in any direction, good or bad. In other words, a positive or negative association would be of interest. If we were testing a drug for hypertension, a nondirectional hypothesis would indicate we were interested in reductions in blood pressure, but we would also be interested in whether a rise in blood pressure occurred. Sometimes called two-sided hypotheses, these are appropriate for exploratory research questions or randomized trials of interventions. These are more rigorous tests than directional hypotheses.

Directional hypotheses, or one-sided tests, are interested only in one direction of change. These are appropriate for research questions in which there is a great

Hypothesis: A restatement of the research question in a form that can be analyzed statistically for significance.

gray matter

Two essential aspects of a good hypothesis are

- A statement of an expected relationship (or lack of one)
- An identification of a direction of interest

Null hypothesis: A statement of the research question that declares there is no difference between groups.

Nondirectional hypothesis: A two-sided statement of the research question that is interested in change in any direction.

Directional hypothesis: A one-sided statement of the research question that is interested in only one direction of change.

Table 4.6

Examples of Hypotheses

Research Question	Null Hypotheses	Alternative, Nondirectional Hypotheses	Alternative, Directional Hypotheses
Do mean minutes of exercise per week differ between cardiac rehabilitation patients who have exercise equipment at home and patients who go to a gym to exercise?	<p>H_0: There will be no difference in mean minutes of exercise per week between cardiac rehabilitation patients who have exercise equipment at home and patients who must travel to the rehabilitation center to exercise.</p> <p>$H_0: \mu_1 = \mu_2$</p>	<p>H_0: The mean minutes of exercise per week will be different for cardiac rehabilitation patients who have exercise equipment at home and patients who must travel to the rehabilitation center to exercise.</p> <p>$H_0: \mu_1 \neq \mu_2$</p>	<p>H_0: Cardiac rehabilitation patients who have exercise equipment at home will exercise more minutes per week than patients who have to go to the rehabilitation center to exercise.</p> <p>$H_0: \mu_1 > \mu_2$</p>
Does the introduction of bar coding on a patient care unit result in lower medication error rates when compared to patient care units without bar coding?	<p>H_0: There will be no difference in the medication error rate between units that do and do not have bar coding.</p> <p>$H_0: \pi_1 = \pi_2$</p>	<p>H_0: There will be a difference in the medication error rate between units that do and do not have bar coding.</p> <p>$H_0: \pi_1 \neq \pi_2$</p>	<p>H_0: Units with bar coding will have a lower medication error rate than units without bar coding.</p> <p>$H_0: \pi_1 < \pi_2$</p>

deal of literature or empirical support for an existing relationship. Directional hypothesis tests are more liberal than nondirectional ones. Examples of null, alternative, directional, and nondirectional research hypotheses appear in **Table 4.6**.

Reading Research for Evidence-Based Practice

The primary reason for critically reading problem statements is to identify concerns or problems and to understand the disparities or gaps between what is known and what still needs to be known about concepts. A secondary reason is to determine the significance of the concerns or problems. The primary reason for critically reading purpose statements is to identify the variables and study design within the context and scope of specific populations and settings. A secondary reason is to determine feasibility and fit.

Problem and purpose statements, as well as research questions, should be stated early in a research report. The problem statement may be inferred and incorporated into

the introduction and review of the need for the study. Often the context of the problem appears in the literature review. The purpose statement should be explicit and near the beginning of the study. It may be alternatively called “objectives,” “aims,” or “goals.” The research question itself should be specific and clear early in the study. The study may or may not report hypotheses, even if it is clearly quantitative and experimental in design. If they are reported, hypotheses often appear in the results section with their associated statistical conclusion.

Using Research in Evidence-Based Practice

By understanding problems, their related concepts or variables, the definition of the population, and the context for a research study, the nurse may be able to generalize the findings to his or her specific nursing practice. The best evidence may then be used to design changes to improve processes and outcomes.

Literature searches may produce hundreds or even thousands of applicable and non-applicable results. To easily and quickly identify applicable studies look for the problem statements and the purpose statements. Problem statements and purpose statements provide readers with the focused context and scope required to generalize research findings to their own nursing practice and establish and support evidenced-based practice within their organizations.

Creating Evidence for Practice

Finding and developing research problems begins with a general concern or focus about a subject or topic. Subjects and topics consist of broad categories and may include examples such as hospital-acquired infections, pain management, patient falls, physiological monitoring, and pressure ulcer prevention. As the process evolves, a problem is identified.

Checklist for Critically Reading Problem Statements

Development

- ✓ Deductive narrowing from general focus or interest

Articulation

- ✓ Stated or inferred?
- ✓ Placement in written report (helpful and logical)
- ✓ Sentence structure (question or statement)
- ✓ Concern (disparity or gap)

Significance

- ✓ Develops, expands, or validates nursing knowledge
- ✓ Develops, expands, or validates conceptual models or theoretical frameworks
- ✓ Improves patient care, staff member, and/or organizational processes and/or outcomes

Checklist for Critically Reading Purpose Statements**Development**

- ✓ Deductive narrowing from problem statement

Articulation

- ✓ Stated or inferred
- ✓ Placement in written report (helpful and logical)
- ✓ Sentence structure (statement)
- ✓ Verb (biased or unbiased)
- ✓ Design described
- ✓ Variables described
- ✓ Population defined
- ✓ Setting specified

Feasibility

- ✓ Required resources (people, time, money, equipment, materials, and facilities)
- ✓ Ethical issues (people and facilities)

Fit

- ✓ Between purpose statement and design
- ✓ Between purpose statement and conceptual models or theoretical frameworks

Research problems consist of narrower categories and may include examples such as ventilator-associated pneumonia, patient-controlled analgesia, blood pressure monitoring, and use of specialty beds to prevent skin breakdown.

Once a problem is identified, the gap between what is known about the problem and what remains to be known about the problem is examined. Special consideration should be given to exploring the gap within the context and scope (population and setting) of the problem. This gap examination occurs primarily through a literature review. Research activities should be focused on narrowing or filling in the gaps. After the gap has been identified, the problem statement(s), purpose statement(s), and research question(s) are developed. The problem statement indicates the focus or interest of the study and raises concerns and questions (disparities and gaps) about general concepts. The purpose statement indicates why the study is being conducted and suggests methods for examining the concepts or variables, and the relationships between them, within a specific population and setting. The research question is a rewording of the purpose statement into a question that suggests methods for examining the concepts or variables and the relationships between them.

Actions that are necessary to create a good research study include a thorough examination of the process traditionally associated with identifying and developing research problems:

- A general focus or interest
- Identification of a concern or problem

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Where to Look

Where to look for information about the research question or hypothesis:

- The research question may be explicitly stated in the research abstract but is commonly only implied by the title of the article, purpose statement, or objectives for the study.
- Ideally, the question is discussed at the beginning of the article, often at the end of the introduction. When it is stated early, it is followed by evidence from the literature review to support why this question is important to investigate further. It may be written as a statement instead of a question. If not at the beginning, look for the question at the end of the literature review.
- The null and alternate hypotheses are often found in the methods section where statistical methods are discussed, along with the rationale for the statistical tests used to test the hypotheses. Hypotheses are typically easy to find and are explicitly identified as such.
- Sometimes a separate section is created for a formal statement of the problem, the purpose of the study, and the research question. It may be labeled “Purpose,” “Aims,” or “Objectives.” The research question may similarly have its own heading.
- If the researcher used any inferential statistical tests, which most quantitative studies do, then there were hypotheses, whether they are stated or not. Sometimes the reader is left to infer what the hypotheses were based on the tests that were reported.

SKILL Builder Write Stronger Research Questions

The most important part of the research process is getting the question right. How the problem is stated determines what measures will be used, what data will be collected, the kind of analysis that will be used, and the conclusions that can be drawn. It is worth the time, then, to carefully consider how this element of the research study is developed. A thoughtful process does not necessarily mean a complicated process, however. Here are some simple suggestions for creating strong research questions:

- Answer the “why” question first. With a solid understanding of the reason for the study, the specifics of the research question are easier to identify.
- Review the literature before finalizing the question. Do not hesitate to replicate the question of a research study that accomplishes similar goals. It is flattering to a researcher—even established, well-known ones—to have their work replicated. Be sure to give credit where credit is due.
- Focus, focus, focus. Refine the research question, mull it over for a bit, and then refine it again. The effort spent to get the question just right will be worth it, because there will be less confusion later as to how to answer the question.
- That said, do not wait until the question is perfect to begin the design of the study. The question is, to some extent, a work in progress as the specifics of the research unfold. The question can, and likely will, be revised as new information, resources, and constraints come to light.
- Keep the research questions focused; do not include more than one major concept per question. Compound questions are hard to study and make it harder to isolate the effects of a single independent variable. Multiple research questions should be used instead of multiple parts of a single question.

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For More Depth and Detail

For a more in-depth look at the concepts in this chapter, try these references:

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- Exploration of the disparity or gap between what is known and what still needs to be known
- Development of the problem statement
- Development of the purpose statement
- Development of the research question

Summary of Key Concepts

- Finding and developing significant problems for research are critical to improving processes and outcomes for patients, staff members, and organizations. For both the researcher and the reader, problem statements, purpose statements, and research questions serve to guide and direct research activities.
- The evolution of a research problem from a general topic of interest to the articulation of a problem statement and a purpose statement serves to narrow the focus of the research into a researchable question.

W CRITICAL APPRAISAL EXERCISE

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

Halcomb, E., Griffiths, R., & Fernandez, R. (2008). The role of patient isolation and compliance with isolation practices in the control of nosocomial MRSA in acute care. *International Journal of Evidence-Based Healthcare*, 6(2), 206–224.

Review the article, looking for information about the problem and purpose statements and the research question. Consider the following appraisal questions in your critical review of these elements of the research article:

1. Is there evidence of deductive narrowing (from general focus to a question) or inductive thinking (from an observation to an overall purpose)? Is it an appropriate approach?
2. Is the problem statement clearly articulated? Is it a question or a statement?
3. Does the problem meet the FINER criteria?
4. Does the research question have all of the PICO elements present?
5. Discuss whether and how this study will contribute to nursing practice.
6. Evaluate what type of research design would answer this question.

- Subjects or topics that are too broad become problematic for researchers because methodological complexities increase, experienced researchers or consultants are required, and resource demands (for example, money, people, and time) increase.
- Sources for researchable problems include clinical practice, educational institutions, focus groups, frameworks and models, professional literature review, performance improvement activities, research, research priorities, and social issues.
- Research problem statements are declarations of disparity: the difference (gap) between what is known and what needs to be known about a topic. They are written as questions or statements and contain clear, concise, and well-defined components (disparities or gaps and concepts).
- Research purpose statements are declarations of intent: what is going to be studied, how it is going to be studied, who is going to be studied, and the context for the study. They are written as declarative, objective statements and contain clear, concise, and well-defined components (design, variables, population, and setting).
- Feasibility is determined by analyzing the strengths, weaknesses, opportunities, and threats (SWOT) of the purpose statement components. Performing the SWOT analysis will indicate if the research study is researchable or nonresearchable.
- There should be a good fit between the design suggested in the purpose statement and the methods used in the research study. There should also be a good fit between the research question and the specifics of the research design, sampling strategy, and measurement.
- Qualitative problem and purpose statements, as well as research questions, are generally broader, more vague, and less prescriptive than those created for quantitative studies. This is because qualitative designs are emergent and may be revised frequently as the study unfolds.

- Research questions for quantitative studies can be developed using the PICO guide by specifying population, intervention, comparison, and outcome. All elements will not necessarily be in every question, because PICO guidelines are most appropriate for experimental designs.
- The FINER criteria—feasible, interesting, novel, ethical, and relevant—serve as a good basis for analysis of the quality of a researchable question. The research question should have an identifiable link to the research design.

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