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Chapter 02: Research Questions, Hypotheses, and Clinical Questions
LoBiondo-Wood & Haber: Nursing Research: Methods and Critical Appraisal for Evidence-Based Practice, 9th Edition

MULTIPLE CHOICE

1. The difference between a research question and a hypothesis is:
   a. a research question is practice based, and a hypothesis is theory based.
   b. a hypothesis attempts to answer the question posed by the research problem.
   c. a research problem defines clinical research and a hypothesis defines basic research.
   d. there is no difference between a research problem and a hypothesis.

   ANS: B

	Feedback
A	Although a hypothesis is sometimes theory based, sometimes it is not. Similarly, research questions are not always practice based. Sometimes they originate in educational theory that relates to nursing education research, and sometimes they originate in basic, rather than applied, research.
B	A hypothesis attempts to answer the research question.
C	Research problems are present in all types of research, and a hypothesis may be present in basic or applied research.
D	Hypotheses and research questions are not identical. Hypotheses flow from research questions and suggest the ways the questions can be investigated.

   PTS: 1 DIF: Cognitive Level: Understanding (Comprehension)
   REF: Page 24

2. How is a hypothesis related to a theory?
   a. Hypotheses can be developed in the absence of a theoretical framework.
   b. Hypotheses must be consistent with an existing theoretical framework.
   c. A theory can determine the validity of a hypothesis.
   d. A theory can be used to evaluate the merit of a hypothesis.

   ANS: B

	Feedback
A	A hypothesis is a bridge between a theoretical framework and the real world of empirical testing. Therefore, a theoretical framework is required.
B	A sound hypothesis is consistent with an existing body of theory and research findings.
C	When tested, a hypothesis can help determine the validity of a theory's assumptions—the reverse of option C.
D	When tested, a hypothesis can help evaluate a theory's merit—the opposite of option D.

   PTS: 1 DIF: Cognitive Level: Understanding (Comprehension)
   REF: Page 24

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3. A nurse makes these statements. Which one has the ***greatest*** potential as an area of nursing research?
   a. "Most of our hospital's admissions come in at night."
   b. "It is difficult to find personnel willing to work the nightshift."
   c. "It seems that most of the patient falls on our unit occur during the nightshift."
   d. "The personnel on the nightshift are not attending promptly to the needs of our patients."

   ANS: C

	Feedback
A	This statement is broad and not specific to patient care. It would need to be defined in much more detail to have potential for nursing research.
B	This broad statement is important to managers responsible for staffing a health care facility. However, it does not show potential for investigation that would contribute to the body of nursing knowledge.
C	This statement identifies a specific, important patient problem. Its exploration has potential to contribute to the body of nursing knowledge.
D	This is a broad subjective observation that does not suggest any approach for investigation or potential for contributing to the body of nursing knowledge.

   PTS: 1 DIF: Cognitive Level: Applying (Application)
   REF: Page 25, Table 2.1

4. The nurse has identified a clinical problem as a potential research question. The next step should be:
   a. identify the variables.
   b. formulate the research hypothesis.
   c. perform a literature review.
   d. determine financial resources for the research project.

   ANS: C

	Feedback
A	It is too early to identify variables. They will be confirmed by the literature review.
B	Although the researcher may have a preliminary hunch about the hypothesis, it cannot be formulated until the research question is formalized after the literature review is completed.
C	The literature review helps to further define the research question by identifying gaps in the literature, the need for replication of prior research, or the need to extend the knowledge base in a particular research area. It also identifies variables essential to consider in refining the research question.
D	The financial resources needed for the project cannot be determined until the study's design and methodology are finalized.

   PTS: 1 DIF: Cognitive Level: Remembering (Knowledge)
   REF: Page 25, Table 2.1, page 26

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5. In a research study, properties of interest that differ in value are:
   a. variables.
   b. concepts.
   c. hypotheses.
   d. assumptions.

   ANS: A

	Feedback
A	This is the widely accepted and often-cited definition of variables.
B	A concept is an abstraction that names an object or phenomenon.
C	A hypothesis is a prediction that helps to answer a research question.
D	Assumptions are statements accepted as true.

   PTS: 1 DIF: Cognitive Level: Remembering (Knowledge)
   REF: Page 29

6. A nurse researcher proposes a study of teenage mothers and their experience with postpartum depression. Considerations that would affect the feasibility of the study would be:
   a. availability of participants.
   b. direction of the hypotheses.
   c. gaps in the literature.
   d. design of the study.

   ANS: A

	Feedback
A	A study's feasibility is determined by practical considerations, such as availability of subjects, equipment, facilities, and money.
B	The direction of the hypothesis is irrelevant to a study's feasibility.
C	Gaps in the literature provide support for the research study and do not affect its feasibility.
D	The design of the study is shaped by the research question and is not directly related to the study's feasibility.

   PTS: 1 DIF: Cognitive Level: Understanding (Comprehension)
   REF: Page 27

7. The most significant difference between independent and dependent variables is:
   a. the dependent variable should change in response to manipulation by the independent variable.
   b. the independent variable should change in response to manipulation by the dependent variable.
   c. although both the dependent and independent variables are manipulated, only the dependent variable is considered an intervention.
   d. although both the dependent and independent variables are manipulated, only the independent variable is considered an intervention.

   ANS: A

	Feedback

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A	Dependent variables change in response to manipulation of independent variables in experimental research.
B	The reverse is accurate. Dependent variables change in response to manipulation of independent variables in experimental research.
C	The independent variable alone is considered an intervention; the dependent variable is the consequence or presumed effect.
D	The independent variable alone is considered an intervention; the dependent variable is the consequence or presumed effect.

PTS: 1 DIF: Cognitive Level: Remembering (Knowledge)
REF: Page 29

8. When designing a research study, the nurse should recognize regarding independent and dependent variables
   a. All research problem statements should contain a dependent and an independent variable.
   b. There should only be one dependent variable associated with a single independent variable.
   c. The relationship between the independent and the dependent variable in any study should be causal.
   d. A given characteristic or situation may be the dependent variable in one study and the independent variable in another.

ANS: D

	Feedback
A	Some descriptive studies may have one variable only, and qualitative studies do not include independent and dependent variables.
B	Many studies include more than one independent variable and more than one dependent variable.
C	The relationship between independent and dependent variables is not necessarily causal. An association between variables need not indicate causality.
D	Depending on the particular study, a specific variable may be the dependent or the independent variable. The causal or associative direction between variables determines the classification of the variables as independent or dependent.

PTS: 1 DIF: Cognitive Level: Understanding (Comprehension)
REF: Pages 29-30

9. A nurse's research question is, "How does maternal employment among health care professionals affect infant health during the first 6 months of life?" In this question, the dependent variable is:
   a. infant health.
   b. maternal employment.
   c. first 6 months of life.
   d. health care professionals.

ANS: A

	Feedback

A	Infant health is the consequence or presumed effect that changes regarding maternal employment. Thus it is the dependent variable.
B	Maternal employment is presumed to effect a change in the infant's behavior (the dependent variable). Thus, maternal employment is the independent variable.
C	The first 6 months of life refers to the time the subjects (mothers and infants) will be observed in the study.
D	Health care professionals constitute the population to be studied.

PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 29

10. A nurse has defined the research question as, "How does oral nutritional supplementation during dialysis treatments affect the serum albumin levels of adult patients who have chronic kidney disease Stage 5?" In this question, the independent variable is:
    a. adult patients with chronic kidney disease Stage 5.
    b. oral nutritional supplementation.
    c. during dialysis treatments.
    d. serum albumin levels.

ANS: B

	Feedback
A	The population being studied is adult patients with chronic kidney disease Stage 5.
B	Oral nutritional supplementation is the intervention administered to effect a change in the patients' serum albumin levels. Thus oral nutritional supplementation is the independent variable.
C	The time of the intervention is defined as during dialysis treatments.
D	The study expects to affect the serum albumin levels of patients who receive the intervention. Thus serum albumin levels constitute the dependent variable.

PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 29

11. A nurse has defined the research question as, "Is there a relationship between self-esteem and body weight among postmenopausal women?" What type of research-question format (or research design) is implied by this question?
    a. Correlational non-experimental
    b. Comparative non-experimental
    c. Quantitative experimental
    d. Phenomenological non-experimental

ANS: A

	Feedback
A	Self-esteem and body weight are variables that are related in an associative way. The word relationship strongly suggests correlational design studies.
B	A comparative non-experimental study would compare differences between two or more groups.

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C	A quantitative experimental study would include an intervention and measure its effect numerically.
D	A phenomenological design would measure the meaning or impact of a phenomenon; "the lived experience."

PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 30, Table 2.2

12. A nurse has defined the research question as, "What is the lived experience of late-stage pregnancy loss among women older than 35 years?" What type of research-question format (or research design) is implied by this question?
    a. Correlational non-experimental
    b. Comparative non-experimental
    c. Quantitative experimental
    d. Phenomenological non-experimental

ANS: D

	Feedback
A	This research question does not indicate an association between variables, which would be studied in a correlational design.
B	A comparative non-experimental study would compare differences between two or more groups.
C	A quantitative experimental study would include an intervention and measure its effect numerically.
D	The question concerns "lived experience," which implies a grounded-theory study design.

PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 30, Table 2.2

13. Which research question is testable as currently written?
    a. Should parents addicted to crack cocaine be permitted to raise their children?
    b. Is the classroom an appropriate place to teach sex education to 10-year-old children?
    c. Are older adults living in assisted-living facilities satisfied with their level of social interaction?
    d. Is a positive HIV/AIDS status a sufficient reason for limiting the employment of elementary school teachers?

ANS: C

	Feedback
A	This question suggests a value statement that is not testable.
B	This question suggests a value statement that is not testable.
C	This example implies variables that can be measured and suggests a comparative non-experimental design study. The independent variable is residing in assisted-living facilities, as compared with not residing in assisted-living facilities. The dependent variable is social interaction.
D	This question suggests a value statement that is not testable.

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PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 29

14. What is the purpose of a hypothesis for any study?
    a. To identify the dependent and independent variables
    b. To provide direction for the study by indicating the expected outcomes
    c. To define the appropriate measures needed to test the research problem
    d. To provide a means of determining the feasibility of the proposed study

    ANS: B

	Feedback
A	A hypothesis does not define the variables but makes a statement about the relationship between two or more variables.
B	A hypothesis is a declarative statement about two or more variables that predicts an expected outcome.
C	A hypothesis does not define the appropriate measures needed to test the research question. The hypothesis does provide direction for the analysis and interpretation of data.
D	A hypothesis does not determine the feasibility of a research problem. A study's feasibility is determined by practical considerations such as availability of subjects, equipment, facilities, and money.

PTS: 1 DIF: Cognitive Level: Remembering (Knowledge)
REF: Page 33

15. Which hypothesis fails to meet the criteria of testability?
    a. Proper handwashing prevents the spread of infection.
    b. Consistent practice of low-impact aerobic exercise will increase coordination among older adults.
    c. Patients who used guided imagery during magnetic resonance imaging (MRI) procedures will have reduced perceptions of emotional distress compared with patients who do not use guided imagery during MRI.
    d. Postoperative patients who receive around-the-clock scheduled analgesics will have lower levels of pain compared with postoperative patients who receive analgesics on an as-needed (PRN) schedule.

    ANS: A

	Feedback
A	This statement does not suggest that there is a predicted outcome as specifically as the other examples. The term *proper* is value laden and nonspecific. Both proper handwashing and spread of infection require more specific definition.
B	This hypothesis includes a predicted outcome.
C	This hypothesis includes a predicted outcome.
D	This hypothesis includes a predicted outcome.

PTS: 1 DIF: Cognitive Level: Analyzing (Analysis)
REF: Page 31

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16. Which hypothesis is non-directional?
    a. Hospitals with an infection-control nurse will have fewer instances of sepsis among inpatients than hospitals without an infection-control nurse.
    b. There will be a greater weight loss among dieting patients who receive a weekly supportive telephone call from a dietitian than among dieting patients who do not receive a weekly supportive phone call.
    c. There will be a difference in stage of disease for prostate cancer among men who had an abnormal prostate-specific antigen screening compared with men who had an abnormal digital rectal examination screening.
    d. Children who receive weekly counseling for 1 year after the death of a parent will perform better in school than children who do not receive weekly counseling after the death of a parent.

    ANS: C

	Feedback
A	This hypothesis gives the expected direction (i.e., fewer).
B	This hypothesis gives the expected direction (i.e., greater).
C	This hypothesis has no expected direction. It suggests a difference but does not indicate the direction of the difference.
D	This hypothesis gives the expected direction (i.e., better).

    PTS: 1 DIF: Cognitive Level: Applying (Application)
    REF: Page 36

17. The nurse has defined the hypothesis as, "There will be no difference in the number of adverse events among patients discharged 2 days after an abdominal hysterectomy compared with patients discharged 4 days after an abdominal hysterectomy." This statement is an example of what?
    a. Directional hypothesis
    b. Non-directional hypothesis
    c. Research hypothesis
    d. Null hypothesis

    ANS: D

	Feedback
A	Because no direction is indicated, this is not a directional hypothesis.
B	A non-directional hypothesis indicates the existence of a relationship between variables but does not indicate the direction. This hypothesis indicates no relationship between variables.
C	A research (or scientific) hypothesis is a statement of the expected relationship of the variables. This hypothesis indicates no relationship between variables.
D	This is a null (or statistical) hypothesis, stating that there is no relationship between the independent (postoperative days) and dependent (adverse events) variables. If in the statistical analysis a significant relationship is found, the null hypothesis would be rejected.

    PTS: 1 DIF: Cognitive Level: Applying (Application)

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REF: Page 36

18. The nurse notes these statements in a research article:
This study explores changes in coping and emotion that occur between the preoperative and the postoperative period. Further, the relationships between coping and emotion preoperatively and postoperatively are evaluated. Finally, the influence of preoperative coping and emotion on postoperative emotion is documented.
This section represents which part of a research study?
a. Results
b. Methods
c. Purpose
d. Hypothesis

ANS: C

	Feedback
A	No results were described in the passage.
B	Although methods are implied, the passage does not include the specific methodology.
C	The statements describe the aims or goals that the investigator hoped to achieve with the research and thus reflect the purpose of the study.
D	The passage does not state the hypothesis of the study.

PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 32

19. A nurse states the purpose of a research study as, "This study will compare the effect of warm and cold applications on the resolution of intravenous (IV) infiltrations in hospitalized older-adult patients in the early postoperative period." In this statement, what constitutes the independent variable(s)?
a. Postoperative older adult patients
b. Early postoperative period
c. Warm and cold applications
d. Resolution of IV infiltrations

ANS: C

	Feedback
A	Postoperative older adult patients represent the population to be studied.
B	Early postoperative period indicates the timing of the intervention.
C	Warm and cold applications represent the independent variables, which will be manipulated and influence the dependent (outcome) variable resolution of IV infiltrations.
D	Resolution of IV infiltrations represents the dependent (outcome) variable of the study.

PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 29

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20. A nurse describes the hypothesis of a research study as, "There is a positive relationship between nurses' attitudes toward AIDS patients and the number of AIDS patients they have cared for in practice." This statement is an example of:
    a. null hypothesis.
    b. non-directional hypothesis.
    c. directional hypothesis.
    d. causal hypothesis.

    ANS: C

	Feedback
A	The statement is not a null hypothesis because a null hypothesis specifies no relationship.
B	The statement is a directional hypothesis, not a non-directional hypothesis.
C	Because a positive relationship is specified, the hypothesis is directional.
D	Because the statement indicates a relationship between variables, the hypothesis indicates an association, rather than a cause-and-effect relationship, between variables.

    PTS: 1 DIF: Cognitive Level: Applying (Application)
    REF: Page 33

21. The nurse has identified a patient situation that may be an area for study. The ***initial*** review of the literature helps the investigator to identify what?
    a. The number of subjects required for the study
    b. The appropriate statistical tests to analyze the data
    c. The need to extend knowledge in a particular area
    d. The instruments needed to collect data during the study

    ANS: C

	Feedback
A	The number of subjects needed for a study is part of methodology, determined after the research question and hypotheses are determined.
B	Statistical tests are part of methodology, determined after the research question and hypotheses are determined.
C	The initial literature review helps further define the research question by identifying gaps in the literature, the need for replication of prior research, or the need to extend the knowledge base in a particular research area. It also identifies variables essential to consider in refining the research question.
D	The instruments to be used in the study part of methodology, determined after the research question and hypotheses are determined.

    PTS: 1 DIF: Cognitive Level: Understanding (Comprehension)
    REF: Page 27

22. Which hypothesis would be classified as a statistical hypothesis?
    a. Oxygen inhalation at 2 L/min by nasal catheter will decrease oral temperature measured with an electronic thermometer.
    b. Oxygen inhalation at 2 L/min by nasal catheter will not affect oral temperature

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measured with an electronic thermometer.

c. There will be a greater decrease in anxiety scores in patients receiving informational videos before open heart surgery than in patients who receive standard written information.
d. There will be a difference in anxiety scores in patients receiving informational videos before open heart surgery and patients who receive standard written information.

ANS: B

	Feedback
A	This hypothesis is a directional hypothesis rather than a statistical (null) hypothesis.
B	A statistical (or null) hypothesis indicates no relationship between variables, as represented in this statement. If in the statistical analysis, a significant relationship is found, the null hypothesis would be rejected.
C	This hypothesis is a directional hypothesis rather than a statistical (null) hypothesis.
D	This hypothesis is a nondirectional hypothesis rather than a statistical (null) hypothesis.

PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 36

23. Which of these statements is correctly phrased as a clinical question for evidence-based practice?
a. What is the best method to insert an enteral feeding tube in an adult patient?
b. Are there differences in the characteristics of various brands of enteral feeding tubes?
c. In addition to aspiration, what are the most problematic complications of enteral tube feedings?
d. What method of determining stomach placement of enteral feeding tubes helps to prevent aspiration in adult patients?

ANS: D

	Feedback
A	This statement includes an intervention (insertion of an enteral feeding tube) and a population (adult patients) but does not include the other PICO elements.
B	This statement includes comparison (differences between feeding tubes) but does not include the other PICO elements.
C	This statement includes only a problem and needs to be further refined to include the PICO elements.
D	This statement is worded as a clinical question and includes the four PICO elements: population (adult patients), intervention (methods of determining stomach placement), comparison (among methods), and outcome (prevent aspiration).

PTS: 1 DIF: Cognitive Level: Applying (Application)
REF: Page 39

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