



**KING SAUD UNIVERSITY
COLLAGE OF NURSING
NURSING ADMINISTRATION & EDUCATION DEPT.**

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NURSING RESEARCH

(NUR 412)

MODULE 3

Research Problem, Questions and Hypotheses

Course Coordinator

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1437 – 1438

Learning Outcomes:

By completing this module, the student is expected to:

1. Identify Sources of Nursing Research Problems
1. Determine Factors to Be Considered When Choosing An Appropriate Topic For A Research Study
2. List The Criteria To Be Considered When Writing A Research Question
3. Discuss The Format For Writing A Research Question
4. Write Research Questions For Proposed Nursing Studies
5. Critique Problem Statements, Purpose Statements, And Research Questions In Published Research Reports And Articles

Selecting, Refining and Defining Research Problems

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Deciding what to study is sometimes the most difficult part of the research. However, care taken during the beginning stages of a study will pay off handsomely.

Here we will begin with the elements of choosing a research topic and problem, reviewing the literature, selecting a new causal model to guide the study, and formulating a research hypothesis.

Definitions:

- **Research Topic:** The broad general area expected to investigate. It is a broad idea or concept from which many problems may be delineated. For example, Quality of patient care, nurse's satisfaction.
- **Research Problem:** A situation or circumstance that requires a solution to be described, explained, or predicted.
 - It is an unsatisfactory situation that wants you to confront.
 - If there is a knowledge gap in an area that need to be investigated, the research problem identifies this gap.
 - Whereas the *research topic* is simply a broad area of interest, the *research problem* identifies what is problematic about that topic.
- **Research Statement:** It is a statement that specifies exactly what is being studied.
 - *The research statement should include six elements:*
 1. Information about the research topic that provoked the study.
 2. The scope of the problem (e.g., how many people are affected by it).
 3. Why it is important to study the problem.
 4. How nursing science would be influenced by the study.
 5. General characteristics of the population of interest.
 6. The overall goal or aim of the study or the question to be answered.

Example of a problem statement:

Hazardous noise is an important occupational health problem because it leads to hearing loss and may lead to increased stress and other deleterious physiological effects..... More than 30 million workers are exposed to hazardous noise on the job... Use of hearing protection devices, specifically ear plugs is known to reduce noise exposure and prevent noise-induced hearing loss... There are, however, relatively few investigators who have examined factors related to the low use of hearing protection by workers.

Sources of research problems:

Where do ideas for research problems come from? At the most basic level, research topics originate with the researcher's interests. Because research is a time-consuming enterprise, curiosity about and interest in a topic are essential to the success of the project. Explicit sources that might fuel the researcher's curiosity include the following:

1. Clinical experience:

- The nurse's every day's experience provides a rich supply of problems for investigation. Whether the nurse is a student, practitioner, educator, or administrator she/he meets many problematic situations.
- Example for such problematic situations include:
 - a. Why things are done this way?
 - b. What would happen if.....?
 - c. Which intervention would work better?
 - d. What causes...?
 - e. Is there a relationship between..... and.....?

Example of a research derived from clinical experience:

A nurse may notice a situation that occurs with a certain amount of regularity; such as a patient with COPD (chronic obstructive pulmonary disease)

- She noticed that: the more anxious the patient becomes, the more dyspneic he becomes.

- So, she may want to validate or affirm the occurrence of that event and factors that could influence its occurrence.

- She may wonder, for example, if:

a. Relaxation technique.

b. Massage.

c. Music.

d. Sleep

*Would decrease
Anxiety and dyspnic
episodes of COPD pts.*

2. Nursing literature:

- Ideas for studies often come from reading the nursing literature, including research reports, opinion articles, and summaries of clinical issues.
- Review of literature involves summarizing what is known and not known about an area of interest. Such gaps in the knowledge base provide direction for the future research.
- Literature review, especially of nursing journals, may also provide ideas for replication.

- **Study replication means** re-producing or repeating a study. This includes three types:
 - a. **Exact replication:** re-doing the research under exactly the same conditions. So determine whether similar findings will be obtained to confirm, validate, or negate the original study.
 - Here, we have to use the same:
 - ✓ Design.
 - ✓ Setting.
 - ✓ Sample
 - ✓ Data collection method.
 - ✓ Data collection tool.
 - ✓ Data analysis method.
 - b. **Approximate replication:** re-doing the research under minority different conditions. For example, different setting, sample, or time, but the same design, data collection method and tool, as well as data analysis method are followed.
 - This is done to determine whether the findings from the original study hold up despite of these minor changes.
 - c. **Constructive replication:** re-doing the research under distinctly different conditions.
 - This is done to challenge the findings of the original study.
 - This challenge is followed to validate, extend findings, and/or test the limits of generalization of the findings of the original work.

3. Theories:

- Another resource for research problems is the theoretical systems and conceptual frameworks that have been developed in nursing and other related disciplines.
- When testing a theory is the purpose of a research, only a portion and not the entire theory is tested.

4. Social issues:

- Global social issues of relevance to the health care community sometimes suggest topics.
- For example, the feminist movement has raised questions about such topics as gender equity and domestic violence.

5. Ideas from external sources:

- External sources can sometimes provide the impetus for a research idea.
- For example, ideas for studies may emerge from reviewing research priorities or because of a brain storming sessions with other nurses, researchers, or nursing faculty.
- Research priorities: is a list of research problems provided by the National Center of Nursing Research (NCNR), and are based on the following concerns:
 - a. Social concerns.
 - b. Patient's concerns.
 - c. Most common health problems.
 - d. Profession's concerns.

Factors to be considered when choosing an appropriate research topic :

1. ***Ethical considerations for research conduction:*** this include considering the ethical code, laws, and Institutional Review Board (IRB).

2. ***Significance to nursing:***
 - a. Will clients benefit from the findings?
 - b. Will health care professionals benefit from the findings?
 - c. Will the findings add to our nursing body of knowledge?
 - d. Can nurses use the results?

3. ***Personal motivation of the researcher*** to select and conduct the research study.

4. ***Researcher Qualification:*** the researcher should have advanced educational preparation in the field of the study. The undergraduate students are encouraged to participate and conduct research studies either independently (alone as a course requirement) or with other researchers from higher skill levels (graduate students, faculty researchers and/or independent organizational researchers ... etc.) .

5. ***Feasibility of the study:*** to judge the feasibility of the study, the following should be considered:
 - a. Whether it helps guide completion for the study.
 - b. Consider the time factor.
 - c. Determine the cost factor.
 - d. Identify equipment and supplies.
 - e. Think about administrative and peer support.
 - f. See if subjects are available for data collection.

Development of a research problem:

The development of a research problem is a creative process that goes through four main steps. These steps are:

1. Selection of the research topic.
2. Contemplating (التفكير بتعمق) the idea.
3. Narrowing the topic.
4. Examining the literature.
5. Writing the statement of the research problem.

Step 1: Selection of the research topic:

1. Usually, the researcher starts to write down general areas of interest as they come to his/her mind (e.g., quality of patient care, infant weight, maternal health...etc)
2. At this stage, it does not matter if the terms used are broad or specific, abstract or concrete. The important point is to put ideas on papers.
3. Then a list of ideas can be classified into:
 - Interesting topics.
 - Familiar topics.
 - Perplexing topics.
 - Feasible/not-feasible topics.
4. And then, choose the most suitable one to work in.

Step 2: Contemplating the ideas:

5. Once a research topic or idea has been identified, the researcher must then explore the phenomena by examining the following eight areas:
 - a. The topics, situations, or problem's precipitating factors.
 - b. How it is exactly viewed or perceived by the researcher.

- c. What are the responses of others who are involved in the situation?
- d. The personal involvement in the situation.
- e. Emotions felt.
- f. Values and biases inherent in, or related to, the topic/situation.
- g. Risk factors associated with searching this topic/situation/problem.
- h. What contribution the research would offer.

Step 3: Narrowing the topic:

- Once a research topic has been specified and contemplated, the researcher must then narrow it down in order to develop a research problem.
- This is done through generating questions from the research topic.
- List of questions can be developed from the research topic, and then investigated in relation to its *feasibility to research*.
- Here are four types of questions that are derived from any research topic:
 1. Non-researchable questions. **XXX**
 2. Questions that have an answer in the literature. **XXX**
 3. Questions that could be answered by logical reasoning/problem solving technique. **XXX**
 - Research generating questions ----- such as: ✓✓✓
 - What causes.....?
 - What factors as associated with...?
 - Is there a relationship between...?

Step 4: Examining the literature:

- Reviewing the related literature at this stage may throw light on:
 - a. Theoretical framework.
 - b. Methodology.
 - c. Data collection methods.
 - d. Data collection tools.
 - e. Data collection techniques.
 - f. Sampling method...etc.

- These components have been utilized to study the problem of interest.

- Review of literature will also help to identify what is known and what is not known about the research problem. Therefore, the research problem could be specified and stated at this point.

Step 5: Writing the statement of the research problem:

- Now, the research problem has to be expressed in a statement. This statement serves as a guide to the researcher in the course of designing the study.

- The problem statement should have the following characteristics:
 1. Identify the *key variables* in the study.
 2. Express a relationship between two or more *variables*. (If not descriptive).
 3. Specify the study *population*.
 4. Imply the *type* of the research.
 5. Identify the study *setting*.

- The problem statement could be done in two forms:
 - **Declarative:** "The relationship between the nurses' job satisfaction and tendency to leave work".
 - **Interrogative:** "Is there a relationship between the nurses' job satisfaction and tendency to leave work?"

- **Research Purpose:** It is the specific aim or goal hope to be accomplished.
 - It reflects "why the problem is being studied"

Example of a purpose statement:

The purpose of this study was to examine the relationship between Nurse's job satisfaction and tendency to leave.

- **Research Question:** It is a direct rewording of the statement of the purpose, phrased interrogatively (استفهامية صيغة) rather than declaratively (صيغة تأكيدية).
 - Questions that are simple and direct invite an answer and help to focus attention on the kinds of data needed to provide that answer.
 - Some research papers omit a statement of purpose and state only the research question. Other research papers use a set of research questions to clarify or amplify the purpose statement.

Example of a research question:

What is the relationship between the nurses' job satisfaction and their tendency to leave the work setting?

Research question criteria:

1. **Interrogative Sentence Form:** it is written in an interrogative (not declarative) manner; need an answer; grammatically correct; understandable and easy to respond to it.
2. **Includes the population of the study:** the researcher should narrow his targets down to the main group of interest (target population) who will benefit from the results of the study.
3. **Includes the variable(s) of the study:** the variables included are according to the type of the study being conducted:
 - a. Univariate study: will include one variable and usually it is exploratory in nature.
 - b. Bivariate study: will include two variables, usually independent variable (cause) and dependent variable (effect). This study is usually Correlational in nature.
 - c. Multivariate study: in this study, more than two variables are under study, and the study focused on investigating the interaction of the variables.
4. **Empirically Testable:** for the experimental studies, the research questions should be written in a manner that is testable.

Research hypothesis:

- It is the research's prediction of the outcome of the research study. That is the expected relationship between the study variables.

- Thus, RESEARCH HYPOTHESIS translates the research purpose into a clear prediction of the expected results or outcome of the study.

- ***How to state a R.H.:***
- Research hypothesis should be stated clearly, concisely, measurably, and in the present tense.

- For a hypothesis to be stated clearly, concisely, and measurably, **three** criteria should be considered:
 1. A relationship should be addressed in each hypothesis.
 2. The variable/condition/relationship must be testable or measurable.
 3. The aim of the research guides what is included in the research hypothesis.

Types of hypothesis:

There are many types of hypotheses:

1. Simple versus complex.
2. Associative versus Causal
3. Null versus alternative.

Simple versus complex hypothesis:

Simple	Complex
It predicts the relationship between one independent variable and one dependent variable.	It predicts the relationship between 2 or more I.V. and 2 or more D.V.
<p>Example :</p> <p>Newborns of smoking mothers (I.V.) have lower birth weight (D.V.) than those of non-smoking mothers.</p>	<p>Example :</p> <p>Structured preoperative support (I.V.) is more effective in reducing surgical patient's perception of pain (D.V.) and request of analgesics (D.V.) than structured post-operative support (I.V.).</p>

Associative versus causal hypothesis:

Associative	Causal
It predicts an association between the I.V. and the D.V. without specifying either a directional or a causal relation.	It predicts a cause-and-effect relationship between the I.V. and D.V.
<p>Example:</p> <p>Maternal age (I.V.) is associated with pregnancy complications (D.V.).</p>	<p>Older mothers (I.V.) give birth to newborns with lower age (D.V.) than those of younger mothers (I.V.).</p>

Null versus alternative hypothesis:

Null	Alternative
It predicts no relationship between I.V. and D.V.	It is the opposite of the null hypothesis. So, it predicts a relationship between the I.V. and D.V.
<i>Example:</i> There is no relationship between maternal smoking and newborn's birth weight.	<i>Example:</i> All the previous examples are alternative hypotheses.

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