



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

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**NURSING RESEARCH
(NUR 412)**

**MODULE 2
Overview of Research Process**

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1437 – 1438

Learning Outcomes:

By completing this module, the student is expected to:

1. Differentiate among various research-related concepts.
2. Distinguish independent, dependent, extraneous, and demographic variables in a study.
3. Identify different types of variables in a research report.
4. 4. Comprehend the basic elements and principles to be considered for professional writing.
5. Distinguish between Vancouver and Harvard styles of referencing.
6. Identify different writing and citation errors in research reports.
7. Identify the elements of the research process in a published research report

I. Basic Research Terminology

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Research, like nursing or any other discipline, has its own language and terminology. Some terms are used by both qualitative and quantitative researchers, whereas others are used in one of them.

- **Study (Investigation or research project):**

"A process of addressing a problem or answering a question through a disciplined research".

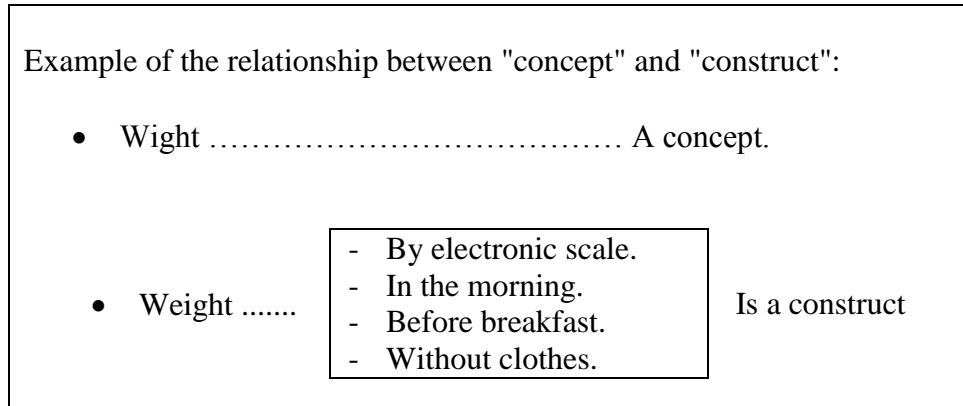
- **Concept:**

"A general idea referring to a behavior or characteristic of an individual, group, or nation". For example, pain, patient care, coping, happiness, cleanliness, dignity...etc.

For all these concepts, even if people know the meaning, yet each may mean different things to different people.

- **Construct:**

"A concept specified in such a way that it is observable in the real world, in order to facilitate testing of the idea". For example, position, in real world has many different meanings in gynecology, in management, and in meeting.



- **Variable:**

"A concept that is observable, measurable, and has a dimension that can vary". For example, temperature is a variable that is observable, measurable, and varies from high to low.

- **Types of variables:** In designing, implementing and evaluating studies, researchers distinguish various types of variables. From these types are the following:
 - 1. Dichotomous variables:** These variables vary in only two values.
 - For example: Male / female; Alive / dead; Day / night.
 - 2. Demographic (Attribute) variable:** A pre-existing characteristic or attribute such as age, sex ...etc. which the researcher simply observes and measures and collect to describe a sample.
 - 3. Active variables:** these are the variables that do not pre-exist, so, the researcher has to create them.



- For example: If the researcher is testing the effectiveness of 4 drugs on blood pressure, here, the drugs (all the four) are considered a variable that varies among individuals. Where different ones are taking different drugs: a, b, c or d.

4. Dependent and independent variables:

- a. **Independent variable:** "It is the variable that is believed to cause or influence the dependent variable". It is also known as experimental or treatment variable.

- b. **Dependent variable:** "It is the variable that is influenced by the independent variable". Also called as outcome variable. It may be a response, behavior or a change that the researcher wants to predict or explain.

Example reflecting the relation between dependent and independent variables:

Does	Smoking	Lead to	Lung cancer?
Does	Nursing care	Lead to	Rapid recovery?
Does	Drug (a)	Lead to	Improvement?
			
Cause			Effect
Independent variable			Dependent variable

N.B. It is common to do a research with multiple dependent and independent variables, for example,

"Factors affecting the nurse's workload"

Factors	Independent variables include No. of patients, type of unit, age group.
Nurse's workload	Dependent variables include overload, balanced load, and nurses' rate of absenteeism.

NOTE:

Not all research studies have independent and dependent variables. Some studies focus on describing the characteristics of single research variables of interest.

- 5. Extraneous variable:** It is the variable that confound the relationship between the dependent and independent variables, thus it needs to be controlled.
 - For example, "air pollution" is an extraneous variable interferes with studying the relationship between smoking "independent variable" and lung cancer "dependent variable".
- 6. Bivariate Study:** A bivariate study explores the relationship between the two variables: Independent and Dependent.
- 7. Multivariate Study:** A multivariate study contains more than two variables that are examined simultaneously. The goal is to determine relationships between and among the variables. For example: the relationship between selected characteristics of the nurses and their tendency to leave work setting.

- (note: the selected characteristics may include: education, experience, position, age,etc.).

- **Conceptual definition:**

"The definition or description of the study variables that is drawn from the theoretical or conceptual framework".

- **Operational definition:**

"The definition or description of a study variable that specifies how it will be observed and measured."

- It is the process that changes the study concepts to an observable and measurable one.
- For example, Weight as a concept is easy to define and measure. However, one still have to write down his/her own definition of weight. It would be "the heaviness or lightness of an object in grams". Somebody else may define it differently as "..... in kilos" or ".....in tons".
- There are some other concepts that are much more difficult to be operationally defined, observed, and measured, such as: social support, patient's satisfaction, nursing care.
- The researcher should specify exactly what does he/she mean by the concept/variable, how he/she is going to observe its variability, and how he/she is going to measure it.

- **Assumption:**

"A statement of principles whose correctness has not been proven, but is taken for granted on the basis of logical reasoning". Such as "health is a priority for all people".

- **Hypothesis:**

"A statement of predicted or expected relationships between the variables of the research (dep. & independent variables)". Hypothesis lead to empirical studies that are seeking to confirm or disconfirm these predictions.

- **Data:**

"Pieces of information that are collected as they pertain to the study".

	Age	Sex	typ adm	Totpr.App	Totpr inapp	Pre1	Pre2	Pre3	Pre4	Pre5	Pre6	Pre7	Pre8	Pre9
1	74	1	1	0	4	23	23	23	25					
2	35	1	1	0	3	23	23	25						
3	42	2	1	0	2	23	23							
4	25	2	1	0	3	23	23	24						
5	53	1	1	0	5	23	23	23	23	24				
6	34	1	1	0	2	23	23							
7	52	1	1	0	3	23	23	24						
8	13	1	1	0	2	23	23							
9	37	1	1	0	6	23	25	23	23	23	23			
10	33	1	1	0	2	23	23							
11	49	1	1	0	3	23	23	22						
12	54	1	1	0	3	23	23	21						
13	39	1	1	0	2	23	23							
14	53	1	1	0	3	23	23	21						
15	70	1	1	0	11	23	23	23	25	13	13	13	21	21
16	50	1	1	0	2	23	23							
17	75	1	1	0	4	23	23	21	21					
18	44	1	1	0	5	23	23	23	25	21				

Fig. Research-related data

- **Limitations:**

"Weaknesses in a research", such as uncontrolled extraneous variables, that limit the generalizability of the findings.

- **Pilot study:**

"A small scale trial done in preparation of a major research".

- **Validity:**

"It is one of the characteristics of the research tool for data collection and refers to the degree or extent to which the tool or instrument measures what it is supposed to measure". For example, a ruler measures the height not the weight, while the scale measures the weight not the height.

- **Reliability:**

"It is one of the characteristics of tools or instruments of research that measure the study variables. It refers to the degree or extent of consistency or dependability with which a study tool measures the variable over time, by different persons".

- **Population:**

"It is the group of people who are going to be studied, and to whom should the study result apply". For example, bedside nurses are the population in a research studying the factors affecting the nurse's workload.

Sample:

"Are those persons – in the population- from whom data will be actually collected, and from whom generalizations about the population will be made".

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II. Professional Writing

Research Article Writing

(APA Style)

Writing has two components: *content* and *style*. *Content* is what you write; while *style* is how you write it. If your paper/assignment/research is poorly prepared (lack of sources, grammatical errors, etc.) then the content of your paper will be lost.

The APA Style of Writing:

(American Psychological Association Style):

- Is a set of rules developed by The American Psychological Association (APA) to assist in the communication of information in the social sciences, psychology as well as other sciences including sociology, education and nursing.

- The main reason for using APA style guide is to be able to communicate your ideas clearly to others.

Major Research Article Sections:

Your essay/research article should include four major sections:

1. Title,
2. Abstract,
3. Main Body, and
4. References.

1. Title:

- Title should summarize main idea of the research paper; be concise, but give direction to the topic of the paper; no more than 12 words and uppercase and lowercase letters.
- For example: Relationship between the nurses' job satisfaction and their tendency to leave the work setting.
- Title should be positioned centered between left and right margins, positioned in upper half of the page.
- It should be followed by following components: Author Name and Institution Author is affiliated with, e.g.: Casey R. Shillam, Kathleen A. Bell, and Linda M. Veltri University of Portland

2. Abstract:

- On the first line of the abstract page, center the word “Abstract” (no bold, formatting, italics, underlining, or quotation marks).
- Beginning with the next line, write a concise summary of the key points of your research. (Do not indent.)
- Your abstract should contain at least your research topic, research questions, participants, methods, results, data analysis, and conclusions. You may also include possible implications of your research and future work you see connected with your findings.
- Your abstract should be a single paragraph double-spaced, between 150 and 250 words.

3. The main body of the research article

- It includes main parts, namely: introduction; background (or literature review); aim of the study; study objectives, questions and/or hypotheses; research design; setting; participants;

data collection tool; data analysis; ethical considerations; results/findings; discussion; conclusion and recommendations.

- The components of the main parts differ according to the requirements of each journal or publishing periodical.

4. *References:*

- **How to write References?**

- There are two systems of writing references, namely: Harvard and Vancouver systems.

Harvard system: The reference list is arranged in alphabetical order according to the author's family name.

Referencing in Harvard System:

a. *Referencing from a textbook:*

Author surname (family name); initial 1st name. , year of publication, title. Edition for books, city & company of publication for books, page

- Example: Zerwekh J, and Claborn J. (2000) Nursing Today: transition and trends. 3rd ed London: W.B. Saunders Company. 54.

b. *Referencing from Periodical articles (scientific journal)*

Author's surname (Family name), 1st name. Title. , journal name. Year of publication: & volume for articles, Number of research article in volume ();, page.

- Example: Stoller E. Preconceptions of the Nursing Role: A case study of an entering class. Journal of Nursing Education. 2008:17(6):2-14.

- c. Referencing from Internet (web-page, site):
- Mullally S. Images of Nurses. November 2003. Available at <http://www.nurseweek.com> . Retrieved, Jun 2013.

- **Page numbers**

The following examples illustrate the use of page numbers

- *One page:* referred to Wells 1992, p. 4
- *Pages that are not in sequence:* Smith 1996, pp. 1, 4 & 6
- *Pages that are in sequence:* Jones & Mackay 1998, pp. 25–28
- *Pages from a web site:* Kelly & McWhirter 1997, p. 1 of 2

Vancouver system: The reference list is arranged in Numbering System as used in text

Referencing in Vancouver (Numbering) System:

- The Vancouver System or (Numbering System) is commonly used in the medical and scientific disciplines.
- References are numbered in the text, either using superscript (e.g., nursing care plan (18)) or within brackets (e.g., nursing care plan [18]), in the order in which they appear.
- A reference, which is cited more than once, is given the same number.
- The references are then listed at the end of the text in numerical order.
- Below is an example of how references should appear in text.

Example 1:

Parkinson's disease is a degenerative disease of the basal ganglia of the brain, characterized by muscular rigidity, tremor, and a shuffling gait ⁽¹⁾. It was first described in 1817 by James Parkinson after whom the condition was later named ⁽²⁾.

Example 2:

Patients with Parkinson's disease have a higher risk of developing dementia than other subjects (3) and some studies have found that Parkinson's disease patients are more depressed than medically ill patients with a similar level of disability (4).

Difference between a reference list and a bibliography:

- ***The reference list*** only identifies sources referred to (cite) in the text of your assignment. You may also be required to provide a bibliography.
- A bibliography is presented in the same format as a reference list but it includes all material consulted in the preparation of your assignment. In other words, a bibliography presents the same items as a reference list but it also includes all other sources which you read or consulted but did not cite.

Activity:

Refer to the research article titled “Medication Errors In Relation To Education & Medication Errors In Relation To Years of Nursing Experience” and “Nurse Perceptions of Medication Errors: What We Need to Know for Patient Safety”, then try to find each of the pre-discussed parts and compare between the two articles.

III. The Research Process



One of the first decisions a researcher makes is whether to conduct a quantitative or a qualitative study. Researchers generally work within a frame consistent with their field (as nursing practice, management, education...etc.). When little is known about a topic, an appropriate frame is identified, and then the researcher moves from the beginning point of a study (the question) to the end (the answer of that question) in a logical sequence of steps known as research process.

The research process can be divided into five main phases:

- **Phase one:** The conceptual phase.
- **Phase two:** The design and planning phase.
- **Phase three:** The empirical phase.
- **Phase four:** The analytic phase.
- **Phase five:** The dissemination phase.

Phase one: The conceptual phase:

The activities involved in this phase include thinking, reading, rethinking, theorizing, and reviewing ideas with colleagues or advisors. During this phase, the researcher calls on such skills as creativity, deductive reasoning, insight, and grounding in previous research on the study topic.

- This phase includes the following steps:

1. Step one: Stating a research problem:

- A researcher starts by moving from a broad area of interest to a more specific problem that tells exactly what he/she is going to study.

- Examples of research questions include:
 - "What are the most common types of high-risk pregnancies in X city?"
 - "What are the risk factors for postoperative pulmonary complications after total abdominal hysterectomy?"
 - "What is the relationship between the nurses' job satisfaction and their tendency to leave work?"
- If a study question is too broad and vague, going through the next steps in the research process becomes very difficult.

2. Step two: Defining the research purpose:

- This is called the aim of the study. It explains the following:
 - Why the question is important?
 - How the answer of this question will serve? (or being utilized?).
- For example, "The purpose of the study is to explore the most common types of high-risk pregnancies in X city in order to direct more attention to their prevention, early detection, and prompt treatment. This would ultimately reduce both maternal and newborns morbidity and mortality."

3. Step three: Reviewing related literature:

- The review of literatures is an essay in which the researcher relates the existing concepts, theories, research methods, and findings to his study question and purpose.

- If researchers want to build on, confirm, and/or contradict the existing knowledge in a field – therefore qualify as a real contribution to science- they must know what has already been done. This is achieved through literature review.
- Literature review provides the researcher with:
 - Ideas for defining concepts.
 - Means for formulating operational definitions.
 - Relevant theories.
 - Related facts, issues, and researches.
 - Prior findings.
 - Instruments for their measurements.

4. Step four: Formulating hypothesis and defining variables:

- That is writing statements about an expected relationship between the study variables.
- Some researches develop hypothesis, while others test hypothesis (experimental).
- Stating hypothesis requires:
 - Sufficient knowledge on the topic to make prediction about the outcome of the study.
 - Development of operational definition for study variables.
 - Explicit statement.
- It could be a hypothesis or a null hypothesis:
 - ***Hypothesis (H)***: tests the idea that there is a relationship between variables. For example, "Mothers who are given analgesics during labor give birth to babies with low Apgar score".

- *Null hypothesis (H_0):* Tests the idea that there is no significant difference in dependent variable other than what can be attributed to chance. For example, “Analgesia in labor does not influence the neonates Apgar scoring”.

Phase two: The design and planning phase:

5. *Step five: Selecting the research design:*

- The research design is a systematic and controlled plan for finding answers to the study question.
- It offers a map for organizing the sample through data analysis.

6. *Step six: Selecting population and sampling:*

- Once the researcher has formulated his study question, reviewed his/her literatures and deciding on a plan for doing the study, he/she is now ready to choose the study population and sample.

7. *Step seven: Developing data collection tools:*

- The tool selection and development depends on:
 - Research type.
 - Nature of population and sample.
 - Data collector's preparation.
 - Time for data collection.
 - Nature of data to be collected.

8. *Step eight: Conducting a pilot study:*

- It is a small scale practice of the study, through which the researcher can learn a lot about the strengths and weaknesses of the research plan as regards:

- The design.
 - The sample.
 - The data collection method.
 - The data collection tools.
 - The data collection technique.
 - The feasibility of the study.
- Through the pilot study, the data collection tool is revised and modified.

Phase three: The empirical phase:

9. Step nine: Data collection:

- Data is usually collected from people, records, or laboratory materials.
- There are several methods for data collection such as:
 - Observation.
 - Interview.
 - Questionnaire.
- Any data collection method needs an instrument or tool such as:
 - Checklist.
 - Scales.
 - Interview guide.
 - Questionnaire sheet.

Phase four: The analytical phase:

10. Step ten: Data analysis:

- It is the process of taking the data that have been collected apart and reorganizing them again in relation to the study questions, objectives, and/or hypothesis.

11. Step eleven: Interpreting and discussing the results:

- The study findings are explained, discussed, and elaborated on in relation to previous findings and what has been written about it in the literature.

12. Step twelve: Writing a conclusion and recommendation:

- Finally, the main study results are organized in specific conclusion that answers the study question and meets its objectives.
- This is followed by recommendations that are based on the study conclusion, suggesting directions for future lines of research.

Phase five: The Dissemination phase:

13. Step thirteen: Communicating conclusions:

- Through writing a detailed research report (Article/Manuscript) and publishing it in the relevant literature.

14. Step fourteen: Utilizing the findings:

- Ideally, the concluding step of a high-quality study is to plan for its utilization in the real field, in order to improve the quality of provided care, conducted education, and research field.

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