

Introduction to Research Methods

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Meaning Of Research:

- ❖ Research defined as systematic gathering of data and information and its analysis for advancement of knowledge in any subject.
- ❖ Research attempts to find answer intellectual and practical questions through application of systematic methods.
- ❖ It is actually a voyage of discovery.
- ❖ According to Clifford Woody research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis.

Objectives Of Research:

- The purpose of research is to discover answers to questions through the application of scientific procedures.
- The main aim of research is to find out the truth which is hidden and which has not been discovered as yet.

➤ Though each research study has its own specific purpose.

1- To gain familiarity with a phenomenon or to achieve new insights into it (exploratory research studies).

2- To portray accurately the characteristics of a particular individual, situation or a group(studies with this object are known as descriptive research studies).

3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies).

4. To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

Types of research: Types of research can be classified in many different ways include the following:

- **Descriptive versus Analytical Research.**
- **Applied versus Fundamental Research.**
- **Qualitative versus Quantitative Research.**
- **Conceptual versus Empirical Research.**

▪ **Descriptive research** concentrates on finding facts to ascertain the nature of something as it exists.

▪ In contrast **analytical research** is concerned with determining validity of hypothesis based on analysis of facts collected.

▪ **Applied research** is carried out to find answers to practical problems to be solved and as an aid in decision making in different areas including product design, process design and policy making.

▪ **Fundamental research** is carried out as more to satisfy intellectual curiosity, than with the intention of using the research findings for any immediate practical application.

▪ **Qualitative research** studies such aspects of the research subject which are not quantifiable, and hence not subject to measurement and quantitative analysis.

▪ **In contrast quantitative research** makes substantial use of measurements and quantitative analysis techniques.

▪ **Conceptual research** is involves investigation of thoughts and ideas and developing new ideas or interpreting the old ones based on logical reasoning.

▪ In contrast **empirical research** is based on firm verifiable data collected by either observation of facts under natural condition or obtained through experimentation.

▪ **Research Methods versus Methodology:**

▪ Research methods or techniques: refer to the methods the researchers use in performing research operations.

▪ research methods can be put into the following three groups:

1- In the first group we include those methods which are concerned with the collection of data.

These methods will be used where the data already available are not sufficient to arrive at the required solution.

2. The second group consists of those statistical techniques which are used for establishing relationships between the data and the unknowns.

3. The third group consists of those methods which are used to evaluate the accuracy of the results obtained.

- It is necessary for the researcher to know not only the research methods/techniques but also the methodology.

- Researchers not only need to know how to develop certain tests, how to calculate the mean, or the standard deviation or chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not, and what would they mean and indicate and why.

- ❖ All this means that it is necessary for the researcher to design his methodology for his problem as the same may differ from problem to problem.

- For example, an architect, who designs a building, has to consciously evaluate the basis of his decisions, i.e., he has to evaluate why and on what basis he selects particular size, number and location of doors, windows and ventilators, uses particular materials and not others.

- We can say that research methodology has many dimensions and research methods constitute a part of the research methodology.

- The scope of research methodology is wider than that of research methods.

- When we talk of research methodology we not only talk of the research methods but also explain why we are using a particular method or technique and why we are not using others.

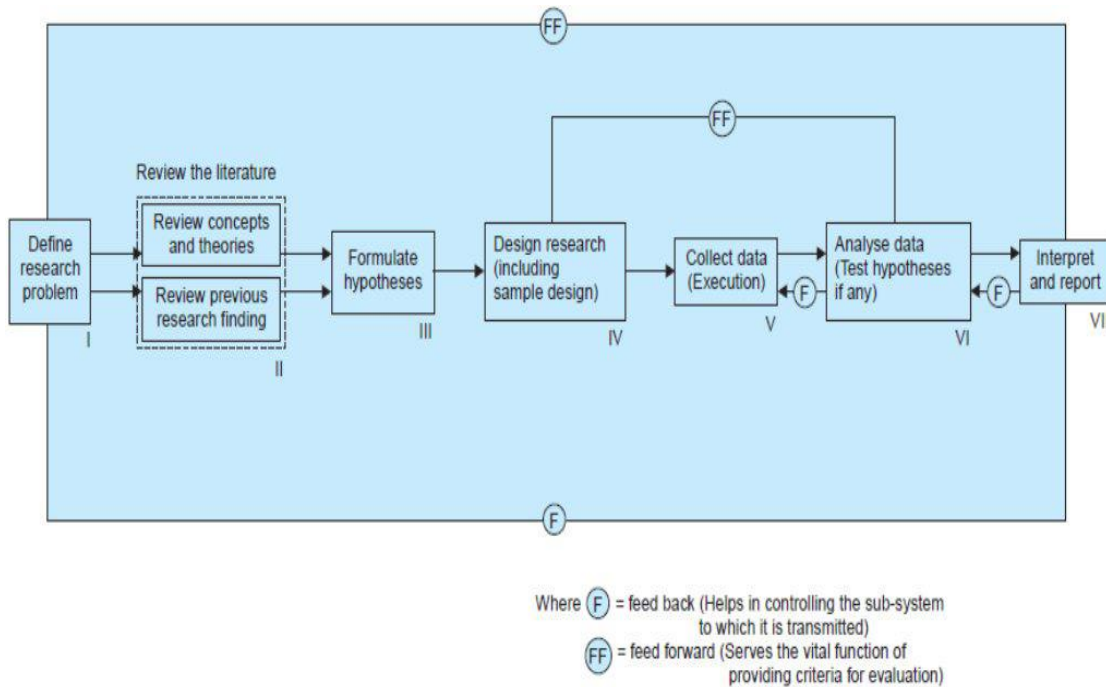
- So that research results are capable of being evaluated either by the researcher himself or by others.

⚙ **Research Process :**

- consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps.

- the first step determines the nature of the last step to be undertaken.

➤ If subsequent procedures have not been taken into account in the early stages, serious difficulties may arise which may even prevent the completion of the study.



Research is a process that takes place in a series of steps:

1. Formulating the research question or problem.
2. Defining the purpose of the study.
3. Reviewing related literature.
4. Formulating hypotheses and defining variables.
5. Selecting the research design.
6. Selecting the population, sample, and setting.
7. Conducting a pilot study.
8. Collecting the data.
9. Analyzing the data.
- 10- Communicating conclusions.

DEFINITION OF NURSING RESEARCH

❖ Nursing research is a systematic approach used to examine phenomena important to nursing and nurses, that clinical practice be based on scientific knowledge.

❖ Research is a process of systematic inquiry or study to build knowledge in a discipline.

❖ **Importance of Nursing Research:**

- Nursing research empowers every nurse's clinical practice.
- Nurses can ask questions aimed at gaining new knowledge to improve patient care, the nursing profession and health care overall.
- Research-based (evidence based) practice = integrating research findings into clinical decision making.
- Accountability for care-related decisions.
- Research expands nursing practice.
- Reinforce the identity of nursing as a profession – knowing/ understanding our patients and the health care experience.

♣ **Nursing research**

- ◆ Provides the foundation for evidence-based nursing practice.
- ◆ Evidence-based practice:
- ◆ The process of systematically finding, appraising, and using research findings as the basis for clinical practice - for making decisions about patient care.

A Research Question Must Identify

1. The variables under study.
2. The population being studied.
3. The testability of the question.

Criteria for developing a good research question: **FINER**

- | | |
|----------------------|----------------------|
| - Feasibility | - Interesting |
| - Novel | - Ethical |
| - Relevant . | |
| - FINER | |
| - Feasible | |
| - Subjects. | |

- Resources.
- Manageable.
- Data Available.
- **Interesting**
- **Novel**
- New idea, untested idea
- **Ethical**
- Social or Scientific Value.
- Safe.
- **Relevant**
- Advance scientific knowledge.
- Influence clinical practice.
- **STUDY DESIGNS**

✚ Are plans that tell a researcher how data are to be collected, from whom data are to be collected, how data will be analyzed to answer specific research questions.

✚ Research studies are classified into two basic methods:

✚ 1-Quantitative research is a formal, objective, systematic process in which numeric data are used.

✚ 2-Qualitative research is a systematic approach used to describe and promote understanding of human experiences such as pain (narrative descriptions) .

Research Design: the basics

- Qualitative.
- Quantitative.
- Descriptive.
- Correlational.
- Quasi-Experimental.
- True Experimental – Randomized. Controlled Trial (RCT).
- Meta-Analyses and Systematic Reviews.

▪ **NURSING RESEARCH DESIGNS:**

▪ The most common designs used in health care research are case study, survey, needs assessment, experimental, quasi-experimental, methodologic, meta-analysis, and secondary analysis.

▪ **Case study designs**

▪ Are used to present an in-depth analysis of a single subject, group, institution, or other social unit.

▪ The purpose is to gain insight and provide background information for more controlled broader studies, develop explanations of human processes, and provide rich descriptive anecdotes.

▪ **Nurse Researcher Roles:**

- Two nursing roles are specifically focused on research:
- The clinical nurse specialist (CNS) and
- The clinical nurse researcher (CNR).

Concept of a Variable:

- Measurable characteristic that varies among subjects.
- Research is conducted because this variance occurs!

Types:

Independent – presumed cause. Example: Salt intake

Dependent – presumed effect. Example: Blood pressure reading.

Variable

♣ **Have 2 or more properties or qualities:**

□ Age, sex, weight, height.

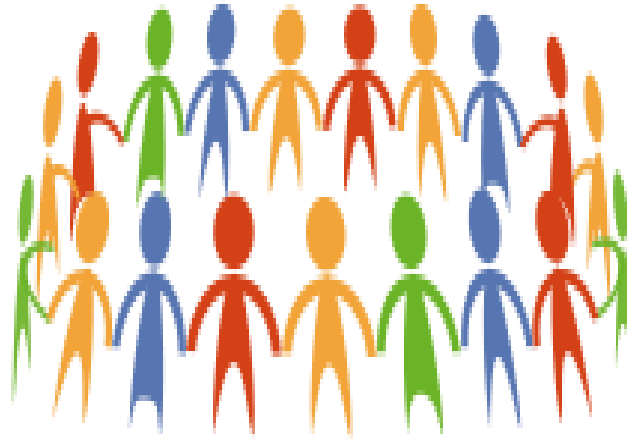
■ **Is one variable related to another?**

“Is X related to Y? What is the effect of X on Y?” etc.

Concept of SAMPLING

✓ Who/what do you want to study?

- ✓ Choosing subjects who are “representative” of the study population
- ✓ Random & Non-Random Sampling- when to use?



Concept of SETTING

- Location of the study - can affect results.
- Natural Setting: Uncontrolled, real life situation.
- Partially Controlled: Manipulated or modified in some way.
- Highly Controlled: Artificial environment for sole purpose of doing research. Decreases effects of outside influences.

• Major Phases in the Research Process:

1. Selecting and defining the problem in need of investigation.
2. Selecting a research design.
3. Collecting data.
4. Analyzing data.
5. Utilizing the Findings.

Design, Variables and Sample

- ☐ Choose study or research design.
- ☐ Identify a Study Population.
- ☐ Design Sampling Plan.
- ☐ Define how will variables be measured.

❑ Setting.

❑ How data will be collected – tools.

Pilot Study – Revisions.

Types of Research:

Experimental vs. non-experimental

➤ **Experimental:** Researcher manipulates or controls variable(s) and observes effect in other variable(s).

➤ Evaluates cause and effect relationship.

Ex: Does a pre-op intervention program to ↑ self efficacy affect self care measures post-op?

❖ **Non-experimental:** Describes or looks at relationships(s) or correlation between variables.

❖ Variables are not manipulated by the researcher.

Ex: Correlation between Hormonal Therapy (HRT) use and breast Cancer.

❖ **Descriptive Research**

❖ Uses questionnaires, surveys, interviews or observations to collect data.

❖ **Correlation Research**

✚ Relationships between and among variables.

✚ Collection of data on at least 2 variables for the same group of individuals.

✚ Calculate-the correlation between the measurers.

✚ Highest number of research studies in nursing are classified as description correlation design.

❖ Time dimension:

Retrospective vs. Prospective

❖ **Retrospective:** Examines data already collected in the past.

Ex: Review of medical records to examine previous history in of cholesterol levels in s/p MI patients.

❖ **Prospective:** examines data being collected in the present.

Ex: Study describing social support and coping mechanisms of women with ovarian Cancer.

◆ **Time Dimension:**

Cross-Sectional vs. Longitudinal

Cross-sectional: Collects data at one point in time - **What exists today?**

Longitudinal: Studies examines variables of interest over a period of time

Advantages –ability to collect data on the same individual over time.

⚙ **CONSUMER OF RESEARCH:**

- Nurses at all levels of educational preparation have responsibility to participate in the research process.
- Nurses become knowledgeable consumers of research through educational processes and practical experience, must have a basic understanding of the research process and critical appraisal skills that provide a standard for evaluating the strengths and weaknesses of research studies before applying them in clinical practice.
- A consumer of research uses and applies research in an active manner.
- The nurse must be knowledgeable consumer of research, one who can critique research and use existing standards to determine the merit and readiness of research for use in clinical practice.