

INTRODUCTION TO RESEARCH METHODOLOGY

UNIT - I



METHODS OF ACQUIRING KNOWLEDGE

- Nursing professionals largely believe in knowledge from highly structured methods such as:
 - Problem solving
 - Scientific methods and
 - Research

PROBLEM SOLVING

- Problem solving process is a primitive way of generating new knowledge as compared to scientific research.
- In problem solving, nurses try to understand the problem, and search for possible solutions.
- In this approach, possible solutions are carefully evaluated and one of them is chosen for implementation.

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- The nurse does not discard the other solutions, but holds them in reserve in the event that the first solution is not effective, other choices can be used.
- The nurse may even encounter a similar problem in relation to a different patient, where an alternative solution may be determined to be the most effective.
- Therefore, problem solving for one solution contributes to the nurse's knowledge for problem solving in other similar situations.

SCIENTIFIC METHODS

- Scientific methods are defined as controlled, systematic investigations that are rooted in objective reality and that aim to develop general knowledge about natural phenomena.

Characteristics of Scientific methods

- They are orderly and systematic processes.
- Scientists attempt to control external factors that are not under direct investigation.
- Their findings are based on the empirical evidences.
- Findings of scientific methods can be generalized, which means that they can be used in situations other than on under study.
- Scientific methods are based on assumptions or hypothesis.
- They are basically conducted to develop or test theories.

Purposes of Scientific methods

The basic purposes of scientific methods are:

- Description
- Exploration
- Explanation
- Prediction
- Control
- Prescription and
- Identification of relationship of the facts.

Steps of Scientific methods

- ❑ Selecting the topic and identifying the research problem
- ❑ Defining the objectives of the study.
- ❑ Reviewing the literature from theory and other related studies.
- ❑ Defining concepts and variables to be studied.
- ❑ Stating hypothesis about expected observations or phenomenon to be studied.
- ❑ Identifying assumptions and implications.
- ❑ Determining the ethical implication of the proposed study.
- ❑ Describing the research design and methods for data collection.
- ❑ Defining study population and sample.
- ❑ Planning data analysis and discussion.
- ❑ Collecting data from subject.
- ❑ Analyzing and interpreting data.
- ❑ Communicating findings of the study.

Limitations of Scientific methods

- Moral or ethical problem
- Human complexity
- Measurement problems
- External variable control problems

MEANING OF RESEARCH

- The word “**research**” is composed of a prefix “**re**” and verb, “**search**”.
- “**Re**” means once again, anew, or afresh.
- “**Search**” means to look for something or examine closely and carefully, to look for information, to test and try, or to prove.
- Therefore, research means close and careful examination of facts and their relationship to discover new knowledge.

DEFINITIONS OF RESEARCH

- Research is defined as a systematic and scientific process to answer to questions about facts and relationship between facts. It is an activity involved in seeking answer to unanswered questions.
- Research essentially is a problem solving process, a systematic, intensive study directed towards full scientific knowledge of subject studies.

- **Ruth M. French, 1968**

- Research may be defined as the systematic and objective analysis and recording of controlled observation that may lead tot the development of generalizations, principles, theories, resulting in prediction and possible ultimate control of events.

- **J. W. Best, 1969**

DEFINITIONS OF NURSING RESEARCH

- Nursing research is defined as the application of scientific inquiry to the phenomena of concern to nursing. Nursing research seeks to find new knowledge that can eventually be applied in providing nursing care to patients.
- Nursing research refers to the use of systematic, controlled, empirical, and critical investigation in attempting to discover or confirm facts that relate to specific problem or question about the practice of nursing.

- Walls and Bauzel, 1981

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- Nursing research is a way to identify new knowledge, improve professional education and practices and use of resources effectively.

- International Council of Nurses, 1986

NEED AND PURPOSES OF NURSING RESEARCH

- Develop, refine, and extend the scientific base of knowledge, which is required for quality nursing care, education, and administration.
- Enhance the body of professional knowledge in nursing.
- Provide foundation for evidence-based nursing practices.
- Help in expansion of knowledge, which is essential for continued growth of nursing profession.
- Enhance their professional identity as research is an essential component of any profession.
- Define the parameters of nursing, which will help nurses to identify boundaries of nursing profession.

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NEED AND PURPOSES OF NURSING RESEARCH Contd...

- Refine and eliminate old knowledge so that it helps in elimination of nursing actions that have no effect on the achievement of desired client outcomes.
- Identify nursing care practices that make a difference in health care status of individuals and are cost-effective.
- Enhance accuracy of different nursing educational and administrative techniques.
- Develop and refine nursing theories and principles.
- Solve the problems or answer questions related to nursing practices, nursing education, and nursing administration.

CHARACTERISTICS OF GOOD RESEARCH

- Good research is systematic, logical, empirical, and also replicable. However, a good research must satisfy the following criteria:
 - ✓ Orderly and systematic process
 - ✓ Based on current professional issues
 - ✓ Begin with clearly defined purposes
 - ✓ Emphasize to develop, refine, and expand professional knowledge
 - ✓ Directed towards development or testing theories
 - ✓ Finding solution of problem
 - ✓ Dedicated to develop empirical evidence
 - ✓ Strive to collect first-hand information/data
 - ✓ An objective and logical process
 - ✓ Generate findings to refine and improve professional practices.

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CHARACTERISTICS OF GOOD RESEARCH

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- ✓ Use of appropriate methodology
- ✓ Conducted on representative sample
- ✓ Conducted through appropriate use of methods and tools of data collection
- ✓ Use of valid and reliable data collection tools
- ✓ Carefully recorded and reported
- ✓ Adequately and appropriately analyzed research
- ✓ Patiently carried out activity
- ✓ Researcher's expertise, interest, motivation, and courage
- ✓ Adequately communicated

TYPES OF RESEARCH

Based on **approach** of studying the variable

- **QUANTITATIVE RESEARCH**
 - - Experimental research
 - - Quasi experimental research
 - - Non experimental research
 - *Descriptive research*
 - *Exploratory research*
 - *Co relational research*
- **QUALITATIVE RESEARCH**
 - - Phenomenology
 - - Ethnography
 - - Grounded theory
 - - Case study
 - - Historical research

Purpose of conducting the research

- Basic research
- Applied research

BASED ON RESEARCH APPROACH

Quantitative research:

- It is an inquiry into an identified problem, based on testing a theory composed of variables, measured with numbers and analyzed using statistical techniques.
- In this type of research, data is collected in numerical form and analyzed by using descriptive or inferential statistics.

Qualitative research:

- It is a field of inquiry that involves an in-depth understanding of human behavior and the reasons that govern human behavior.
- The data is collected in descriptive form rather than numerical form and analyzed by descriptive coding, indexing, and narrations. Eg: words, pictures or objects.

BASED ON RESEARCH PURPOSE

Basic or fundamental or pure research: is performed without a specific purpose in mind. It is primarily concerned with generation of new knowledge.

- It is carried out for some of the following aims:
 - Gather and generate information
 - Expand the body of knowledge to improve understanding about a discipline
 - Develop or refine theories and principles.

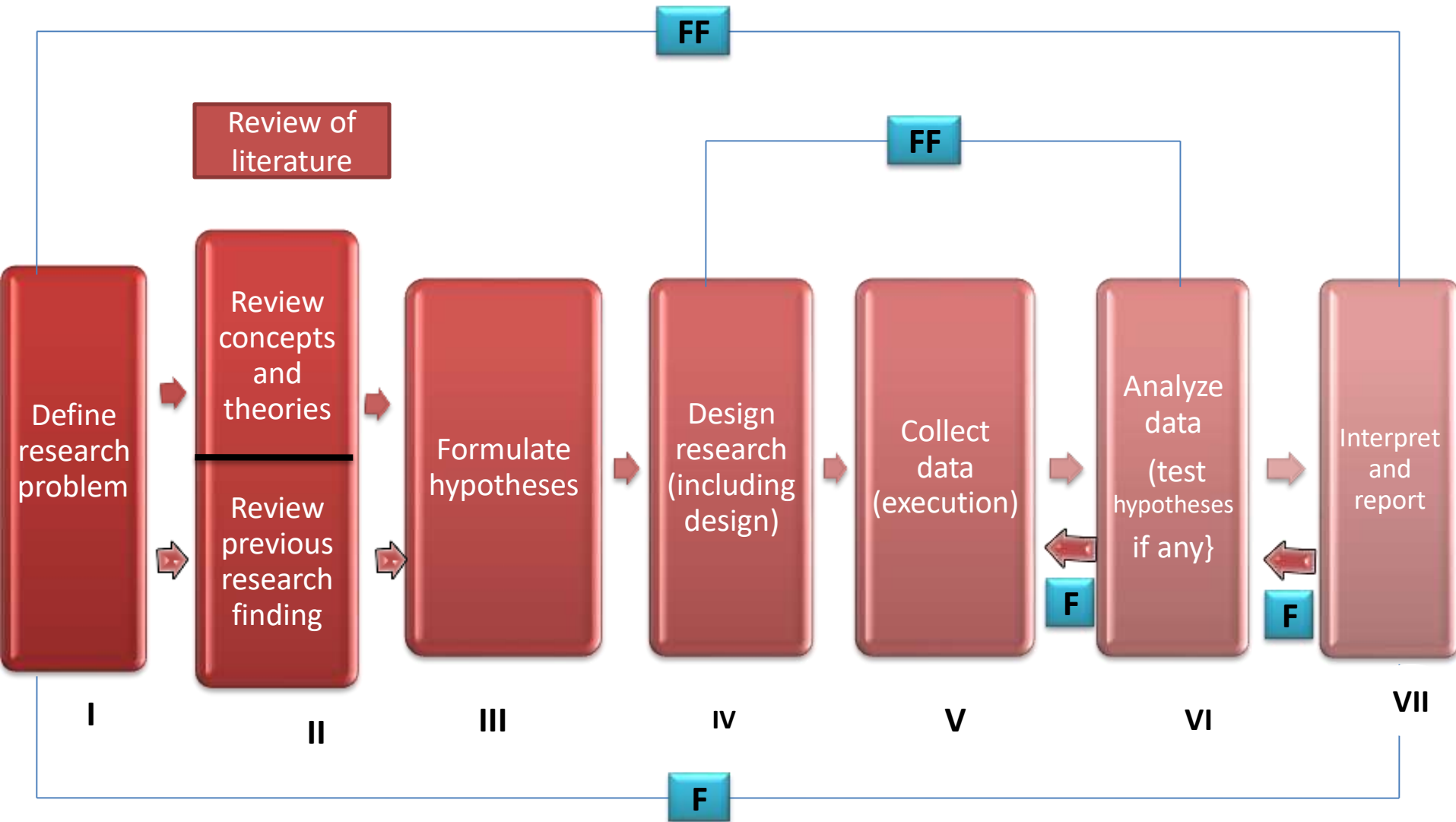
Applied research: it refers to those studies which have functional purposes and practical use or application. They focus on immediate solution to an existing problem.

- It is conducted to resolve a number of issues, some of which are as follows:
 - ✓ Solve problems
 - ✓ Make decisions
 - ✓ Evaluate something of interest
 - ✓ Develop something new for immediate use.

RESEARCH PROCESS

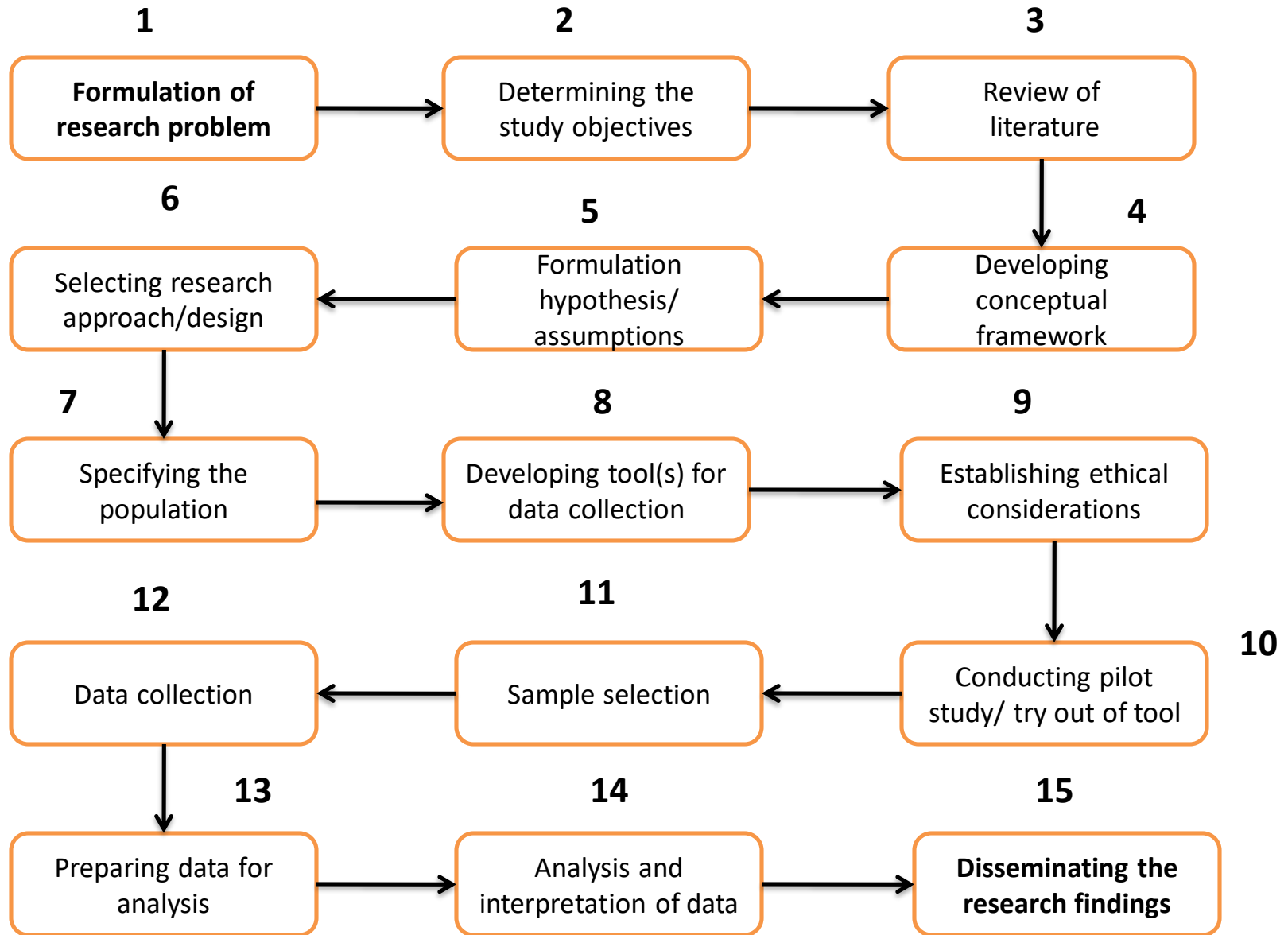
- Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps.

RESEARCH PROCESS IN FLOW CHART



F= Feedback (helps in controlling the sub system to which it is transmitted)
FF= Feed forward (serves the vital function of providing criteria for evaluation)

STEPS OF QUANTITATIVE RESEARCH PROCESS



STEPS OF QUANTITATIVE RESEARCH PROCESS

- **Formulating of research problem**
 - ❑ Substantive dimension: Is the research problem clinically or theoretically important?
 - ❑ Methodological dimension: What is the best possible way to study this problem?
 - ❑ Practical dimension: Are adequate resources available to conduct the study?
 - ❑ Ethical dimension: Would this problem respect the rights of the study subjects?
- **Determining study objectives**
 - ❑ This step also includes writing operational definitions of the variables under study.
- **Review of literature**
- **Developing conceptual framework**
- **Formulating hypothesis/assumptions**

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- **Selecting research approach/design**

- ❑ ‘who’: Specifies the subject(s) under study. For example, patients, families, groups etc
- ❑ ‘what’ : Specifies the variables which are to be focused upon and measured.
- ❑ ‘when’: Specifies the time of the study, duration, and frequency of the observations.
- ❑ ‘where’ : Specifies the setting of the study; that is where the researcher will be conducting the study.
- ❑ ‘how’: Specifies how the data will be collected.
- ❖ **Experimental:** the experimental researches, there is random assignment of subjects, and an availability of a control group to compare with the experimental group, and manipulation of independent variable to observe the effect on dependent variable in an experimental group.
- ❖ **Quasi - Experimental:** the studies involve manipulation of independent variables to observe the effect on dependent variables, but usually they do not exert complete control over extraneous variables in manipulation and randomization.

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❖ **Non- Experimental:** in this design, the research variables are studies without manipulating them in natural setting for the purpose of description, exploration, explanation, or identification o correlation between 2 or more variables.

- **Specifying the population**
- **Developing tool(s) for data collection**
- **Establishing ethical considerations**
 - Taking informed consent from participants
 - Avoiding errors in data collection
 - Obtaining the permission from competent authority to conduct the study
 - Doing justice to participants in analyzing data
 - Maintaining confidentiality of the information and anonymity of subjects
- **Conducting pilot study/ try out of tool**
- **Sample selection**
- **Data collection**
- **Preparing data for analysis**
- **Analysis and interpretation of data**
- **Disseminating the research findings**

STEPS OF QUALITATIVE RESEARCH PROCESS

