

Kolkata Chapter

Research Methodology
Part 2

Prof (Col) Dr RN Basu
Adviser, Quality & Academics
Medica Superspecialty Hospital, Kolkata

1

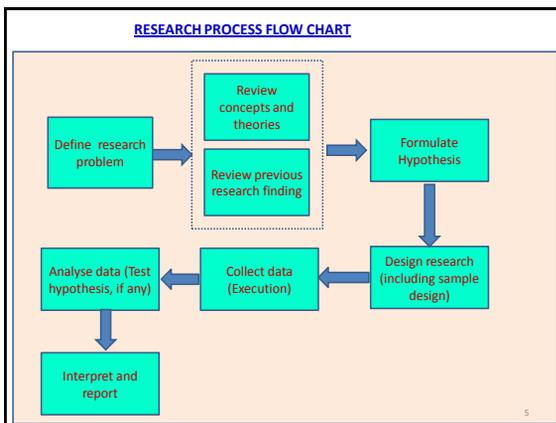
Review of Part 1

- Part 1 of the presentation dealt with the basic aspects of research methodology
- It included topics such as:
 - Meaning of research
 - Definition of research
 - General characteristics of research
 - Objectives of research
 - Motivation in research

- Contd.
 - Types of research
 - Introduction to research methodology
 - Research approaches
 - Quantitative approach
 - Qualitative approach
 - Sub-classification of quantitative approach
 - Inferential
 - Experimental
 - Simulation
 - Significance of research

Introduction to Part 2 of the Presentation

- This part deals with research process
 - The research process has several steps
 - These steps are:
 - Formulation of research problem
 - Formulation of researchable question
 - Literature survey
 - Development of working hypothesis
 - Research design
 - In future presentation, the following will be included:
 - Presentation of findings
 - Analysis, and
 - Report writing



Research Process (1/19)

- The chart indicates that
 - the research process consists of a number of closely interrelated activities
- Such activities overlap continuously
 - strict sequence may not be followed
 - at times, the first step determines the nature of the last step to be undertaken
- The steps are not mutually exclusive nor they are separate and distinct

6

Research Process (2/19)

- Description of the steps:
 1. Formulating the research problem
 - There are two types of research problems
 - Those that relate to states of nature
 - Those which relate to relationships between variables
 - At the very outset the researcher must single out the problem he wants to study
 - He must decide the general area of interest or aspect of a subject-matter that he would like to enquire into
 - Initially the problem may be stated in a general way and then ambiguity, if any, relating to the problem be solved
 - The feasibility of a particular solution has to be considered before a working formulation of the problem can be set up

7

Research Process (3/19)

- Researchable Question
 - A researchable question is one that:
 - yields facts to help solve a problem,
 - produce new knowledge,
 - add to theory, and/or
 - improve medical or administrative practice.
 - An opinion is not a researchable question
 - Research deals with facts
 - Facts are observable phenomena in the real world.
 - Answers to the research question explain, describe, identify, substantiate, predict, or qualify

8

Research Process (4/19)

- Research question sets a direction for the research
- In the research question, only the essential elements are kept
 - Interesting but irrelevant matter should be excluded
- There are no rigid rules for formulating a research question
- A research question should imply action
- Therefore, a statement is not a research question
 - Example:
 - Nurses are dedicated to patient care
 - This is a statement, and it does not imply any question
 - Are nurses dedicated to patient care?
 - This is action oriented

9

Research Process (5/19)

- Writing a researchable question
 - Type of question that is asked forms the base of the research
 - The research question should not begin with would or could
 - Because, these questions can be answered with yes or no
 - These are not researchable
 - To answer, no research is required. Everyone has an opinion on everything
 - Research question should begin with an action verb such as what, how, why etc.

10

Research Process: Formulating Research Problems (6/19)

- Research problems are questions that we cannot answer with our present knowledge
 - They point either to
 - Problematic phenomenon
 - Observed events that are puzzling in terms of our currently accepted ideas, or
 - To problematic theories
 - Current ideas that are challenged by new hypothesis
- In addition to gaps or uncertainties in current knowledge, research also seeks to generate new knowledge

11

Research Process: Formulating Research Problems (7/19)

- At the beginning of a research, what one has is only a problem
- Northrop (1966) writes,
 - “Inquiry starts only
 - when something is unsatisfactory,
 - when traditional beliefs are inadequate or in question,
 - when the facts necessary to resolve one’s uncertainties are not known
 - when the likely relevant hypotheses are not even imagined
 - At the beginning of any research one only has a problem for which an answer is needed”

12

Research Process (8/19)

2. Extensive literature survey
 - Once the problem is formulated, a brief summary of it should be written down
 - A protocol needs to be written down
 - It is submitted to the scientific committee for procedural approval, and
 - to the ethics committee for ethical approval
 - At this juncture, the researcher should undertake extensive literature survey connected with the problem
 - Various sources such as journals, conference proceeding, government reports, books, etc may be searched
 - One source may lead to another

13

Research Process (9/19)

3. Development of working hypothesis
 - This is an important consideration in quantitative research
 - Hypothesis is a specific statement of prediction
 - It describes in concrete (rather than theoretical) terms what you expect will happen in your study
 - Definition of hypothesis
 - There are many definitions, one definition is:
 - According to Kerlinger,
 - 'A hypothesis is a conjectural statement of the relationship between two or more variables'

14

Research Process (10/19)

- From the study of various definitions it transpires that:
 - A hypothesis is a tentative proposition
 - Its validity is unknown
 - In most cases, it specifies relationship between two or more variables
- All studies do not have hypothesis
 - Sometimes a study is designed to be exploratory

15

Research Process (11/19)

- There is no formal hypothesis
- The purpose of the study is
 - to explore some area more thoroughly in order to develop some specific hypothesis
 - The hypothesis can be tested in future research
- To develop a proper research hypothesis:
 - Discuss with colleagues and experts
 - Examine available data and records for possible trends
 - Review similar studies
 - Exploratory personal investigation in a limited scale

16

Research Process (12/19)

4. Preparing the research design
 - What is a research design?
 - The research design is a plan, structure, strategy of investigation so conceived as to obtain answer to research question or problems
 - The plan is the complete scheme or programme of the research
 - It includes an outline of:
 - what the investigators will do
 - Includes steps from writing the hypothesis and their operational implications to the final analysis of data

17

Research Process (13/19)

- Functions of research design
 - The research design has two main functions
 - Firstly
 - Identification and/or development of procedures, and
 - logical arrangement required to undertake a study
 - Secondly
 - To emphasise the importance of quality in these procedures to ensure their validity, objectivity and accuracy
 - The most important requirements of a research design
 - to specify everything clearly
 - so a reader will understand what procedures to follow, and how to follow them

18

Research Process (14/19)

- Research design should do the following:
 - Name of the study design per se – cross sectional, comparative , control experiment or random control
 - Should provide detailed information:
 - Who will constitute the study population?
 - How will the study population be identified?
 - Will a sample or the whole population be selected?
 - If a sample is selected, how will it be contacted?
 - How will consent be sought?

19

Research Process (15/19)

- What method of data collection will be used and why?
- In the case of a questionnaire, where will the responses be returned?
- How should respondents contact you if they have questions?
- In the case of interviews , where will they be conducted?
- How will ethical issues be taken care of?

20

Research Process (16/19)

- Differences between quantitative and qualitative study design
 - In qualitative research, agreement of the respondents with that of the researcher on various aspects is important
 - In quantitative research, the respondent is not so important
 - In quantitative research, replication of the research is possible to obtain the same result
 - In qualitative research, the design is less rigorous so replication is rarely possible

21

Research Process (17/19)

- Quantitative research design can be classified somewhat arbitrarily into the following broad categories:
 - The number of contacts with the study population
 - The reference period of the study
 - The nature of the investigation
- These terminologies are not universally used
- The names of the designs within each classification base are universally used
- Designs within each category are mutually exclusive
- In addition to the above categories, another category can be added to include other commonly used designs

22

Research Process (18/19)

- Study design based on the number of contacts
 - Cross-sectional studies
 - Before-and-after studies
 - Longitudinal studies
- Study design based on reference period
 - Retrospective
 - Prospective
 - Retrospective-Prospective

23

Research Process (19/19)

- Study design based on the nature of the investigation
 - Experimental
 - Non-experimental
 - Quasi or semi experimental
- Experimental study design – many
 - The after-only experimental design
 - Before-and-after experimental design
 - The control group design
 - The double-control design
 - The comparative design
 - The matched control experimental design
 - The placebo design

24

Cross-sectional Study Design

- Cross-sectional studies
 - This type of studies are also known as one-shot or status studies
 - These are most commonly used design in the social sciences
 - Most suited to studies for
 - Finding out the prevalence of a phenomenon, situation, problem, attitude or issue
 - Done by taking a sample of cross-section of population
 - These studies are very simple in design

25

Cross-sectional Study Design

- Examples of cross-sectional studies that are most suitable for a study of the following topics:
 - The attitude of study population towards construction of nuclear power plant at Kudankulam Nuclear Power Plant in Tamil Nadu
 - The socio-economic characteristics of patients visiting medica superspecialty hospital
 - Employee engagement level at medica
 - Age distribution of nursing personnel in different hospital in Kolkata

26

The Before-and-After Study Design

- The advantage of this type of studies is that it can measure the change in a situation after an intervention
- Effectiveness of a programme can be very appropriately measured by this type of study
- In this, two sets of cross-sectional data are obtained from the same population to find out the changes
- Example:
 - The hypothesis that *May I Help You* counter girls work standing and the tiredness affects their behaviour in the later part of the day
 - The hypothesis can be proved or disproved by providing sitting and doing a before-and-after study

27

Thank you