

Basics of Research

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Introduction

Definition of a research

A quest for knowledge through diligent search, investigation or experimentation aimed at the **discovery and interpretation of new knowledge**

Introduction

Objectives of Health Research

- **Estimation: Prevalence and incidence**
- **Association: Between variables**
- **Evaluation: Intervention**

Stages of Research

- **Planning**
- **Implementation of plan- data collection**
- **Data processing and analysis**
- **Report writing**

Stages of Research: Planning

Identifying problem

- thought organization, imagination

Knowledge building about the problem

- discussion with experts
- literature review

Finding unanswered questions

- uncertainty about something need to be resolved

Selecting question(s) for own research

- selecting uncertain thing(s) from unresolved things

Stages of Research: Planning

Stating the research question/questions

- hypothesis, objectives

Deciding appropriate research design and Methodology

- research type, ascertainment technique

Fixing data collection plan & instruments

- procedure, selecting/developing instruments

Organizational measures

- research team, finance, management, approval, information & communication

Stages of Research: Planning

Research Question(s)- RQ

The uncertainty about something that the investigator wants to resolve by making observations on own study subjects

A good RQ are:

Interesting

Novel

Ethical

Feasible

Relevant

Stages of Research: Planning

Research Hypothesis (RH)

A transformation of Research Question to a testable prediction for research
Hypothesis must be a précised and clear statement

Type of Hypothesis

Null Hypothesis (where little evidence of the prove, usally tasted)

Alternative Hypothesis (where enough evidence to be proved either from null hypothesis or earlier studies or from evidence of other findings or researcher's or others clear observation)

It is not the questions of prove or disprove for a successful research

Stages of Research: Planning

Research Aims/Objectives

A more action oriented transformation of the research question(s) and hypothesis

It must be very clear and specific

Objectives are :

General Objective

Specific Objectives

Stages of Research: Planning

Research Question(s), hypothesis(s), and objectives of a proposed study determine the study design and methodology to be followed for that study

The **question is the life** and the **aim is the core** of a research to whom whole research stands

Stages of Research: Planning

Study Design

Scientific and ethical ways and methods of research to harvest valid and reliable information

Selection of study design depends on

Types of problem

Knowledge about the problem

Available resource

Stages of Research: Planning

Types of Study design

- Qualitative & Quantitative
- Observational & Experimental
- Descriptive & Analytical
- Retrospective & Prospective
- Cross sectional & longitudinal
- Case Control & Cohort
- Randomized Control Trial (RCT)
- One-stage & two-stage

Stages of Research: Planning

Sampling

Sampling is the process of selecting a subset of population for the purpose of drawing conclusion

Purpose of sampling

to achieve maximum reliability within a given source

For sampling defining the following are necessary:

1. Population
2. Sample
3. Sampling frame
4. Sampling fraction
5. Sampling unit
6. Sample size
7. Participation rate

Stages of Research: PlanningG

Sampling

Common Sampling techniques are:

Non-probability Sampling

Probability Sampling

Stages of Research: Planning

Sampling

Non-probability Sampling are:

- Convenience Sampling
- Consecutive sampling

Stages of Research: Planning

Sampling

Probability Sampling are:

- Simple Random sampling
- Systemic sampling
- Stratified sampling
- Cluster Sampling
- Multistage sampling

Research Protocol

A written detailed scientific plan of the study

“Research proposal”, “Research Project Proposal” are the alternative names

Research Protocol

Before writing

What I will do?

Why do I want to do this research?

How will I do that?

Is it feasible?

Who will my supervisor(s)?

What advice and support do I need ?

What results do I expect?

What are the possible implication of my research?

(If there is no significant implications, do not proceed)

Research Protocol

During writing:

What is the way of writing?

What are the elements of the protocol in writing ?

What organizational structures should I follow?

Use the format and guideline of the Institution for protocol writing to whom you are going to submit

Research Protocol

Elements in a Protocol:

Title

Abstract

Introduction

Methodology

Analyses of the results

Implication of the results

References

Appendices

Research Protocol

Title:

It must be précised, clear, understandable, comprehensive and representative of the whole research

It must reflects the objectives and also methodology

It should be finalized after total writing of the protocol

Research Protocol

Abstract:

It is the summary of the main elements of the protocol
It must be brief with representative words and sentences
and not cut-copy-pest of the elements of the protocol
Other than globally recognized, there should be no
abbreviation

It must be organized and balanced among each
components

It is the researcher's own writing and **no reference is
necessary and allowed**

It should be written and finalized after writing of the whole
protocol

Research Protocol

Introduction:

Background information- state of the problem in brief, relevant literature summery findings, information gap and reason of this gap, supporting information from observation, personal communication, expectation of researcher

Rationale-stating reason of doing study by researcher's own words(**no citation and reference**). State both positive and negative reasons referring expected outcome and implication in brief

Research Protocol

Introduction:

Research Questions-clear, specific and objectively understandable

Hypothesis- precisely formulated statement
It is not the questions of prove or disprove for a successful research

Aims/Objectives: must be clearly and sufficiently described

General & Specific

Ultimate

Additional

The question is the life and the aim is the core of a research to whom whole research stands

Research Protocol

Methodology:

Methodology is the means of attaining objectives.

Study design-Type of study and methodological framework

Place(s) of study- Name, location, relevant brief description and justification

Study population-state clearly along with source

Research Protocol

Methodology:

Sample size-describe appropriate formula for calculation, using source & reference of power calculation

Ethical consideration- review board/clearance authority, mention relevant ethical issues, informed consent

Selection criteria- inclusion, exclusion (Note: 'subjects who will not give consent' can not be an exclusion criteria)

Sampling technique-sampling type, reason for selection, sampling frame

Research Protocol

Methodology:

Research Instruments- Name with reference, purpose, brief description, psychometric properties, and reasons for selection this instruments, why and how it will be used from for this study.

Researcher's developed instruments- name, description contents, process of developing, purpose.

(full instruments will be placed in the appendices)

Research Team- Number, post titles, job description structure, functional line up

Pretesting/Piloting- process, sample size, methods, purpose, expected outcome

Research Protocol

Methodology:

Procedure-

Start and finish with the starting action to the finishing action of implementing methodology.

Mention who will do what in each steps.

How and who will apply the instruments.

What difficulties could arise and how it will be solved.

Mention how the ethical issues will be maintained.

Mention how the quality of the data collection will be ensured.

Mention the average time required for each subject.

Mention how and by whom the data will be preserved safely

Research Protocol

Methodology:

Time frame and work schedule- mention the duration of research, name of the task and estimated time frame.

Budgets and financial sources- use standard format with specific head, make it rational

List of variables with operational definitions- define clearly with source. If any variable defined by the researchers mention its basis and reason

(The list of variables may be placed in the appendices)

Appropriate sound methods are key strength of research and interpretation of findings

Research Protocol

Analyses of the results:

Process of readiness of the data for analyses

Name of the statistical package that will be used

Steps of analyses according to objectives

Mentioning appropriate statistical tests in each step with the reason of use

Plan of presenting results

Research Protocol

Implication of the results/findings:

Expected outcome (may be positive or negative)

Possible utilization of the findings- immediate and long term in the specific areas-clinical practice, policy making, disease understanding, future research

Impact of the findings-local and global

Research Protocol

References:

Follow a single system

Keep in mind the pattern of referencing adopted by the Institution/Organization

Give references only that are sited in the text

Research Protocol

Appendices:

Follow the orders as stated in the text

Follow the same naming and title style for all

It contains

- Ethical and other Forms
- Permission Letters, Agreement letter
- Operational Definitions
- Questionnaire/ Instruments
- Data Sheet
- Statistical Formula
- Photograph

Thesis / Dissertation

Definition

“A written essay, treatise, or disquisition, especially one required by colleges and universities as partial fulfilment of requirement for a degree”

Dissertation and Thesis are the same and named as per requirement of the Institution for offering a Degree

Writing a Thesis / Dissertation

General aspects

- Title Page- Title, Author, Institution, Year
- Declaration by the Researcher
- Supervisor's Certificate
- Approval page
- Dedication (Optional)
- Acknowledgement
- Contents with page number
- List of Tables
- List of Figures/Graphs
- List of Abbreviations & glossaries

Writing a Thesis / Dissertation

Technical Aspects

(Structure of a Thesis / Dissertation)

- Title of the Dissertation /Thesis
- Abstracts & keywords
- Introduction
- Review of the Literature
- Methodology/ Materials & Methods
- Results
- Discussion
- Conclusion & Recommendation
- References/ Bibliography
- Appendices

***Let us open our inquisitive and analytical
mind for evidence based findings***

Thank you!