

# RESEARCH PROCESS

# Steps of research process

- Identifying the research problem
- Determination of the purpose of the study
- Review of literature
- Developing a theoretical/conceptual framework
- Identifying the study assumptions
- Acknowledging the limitations of the study
- Formulating the hypothesis or research question
- Defining the study variables
- Selecting the research design

- Identifying the population
- Selecting the sample
- Conducting the pilot study
- Collecting data organizing the data for analysis
- Analyzing the data
- Interpreting the findings
- Communicating the findings

# RESEARCH PROBLEM



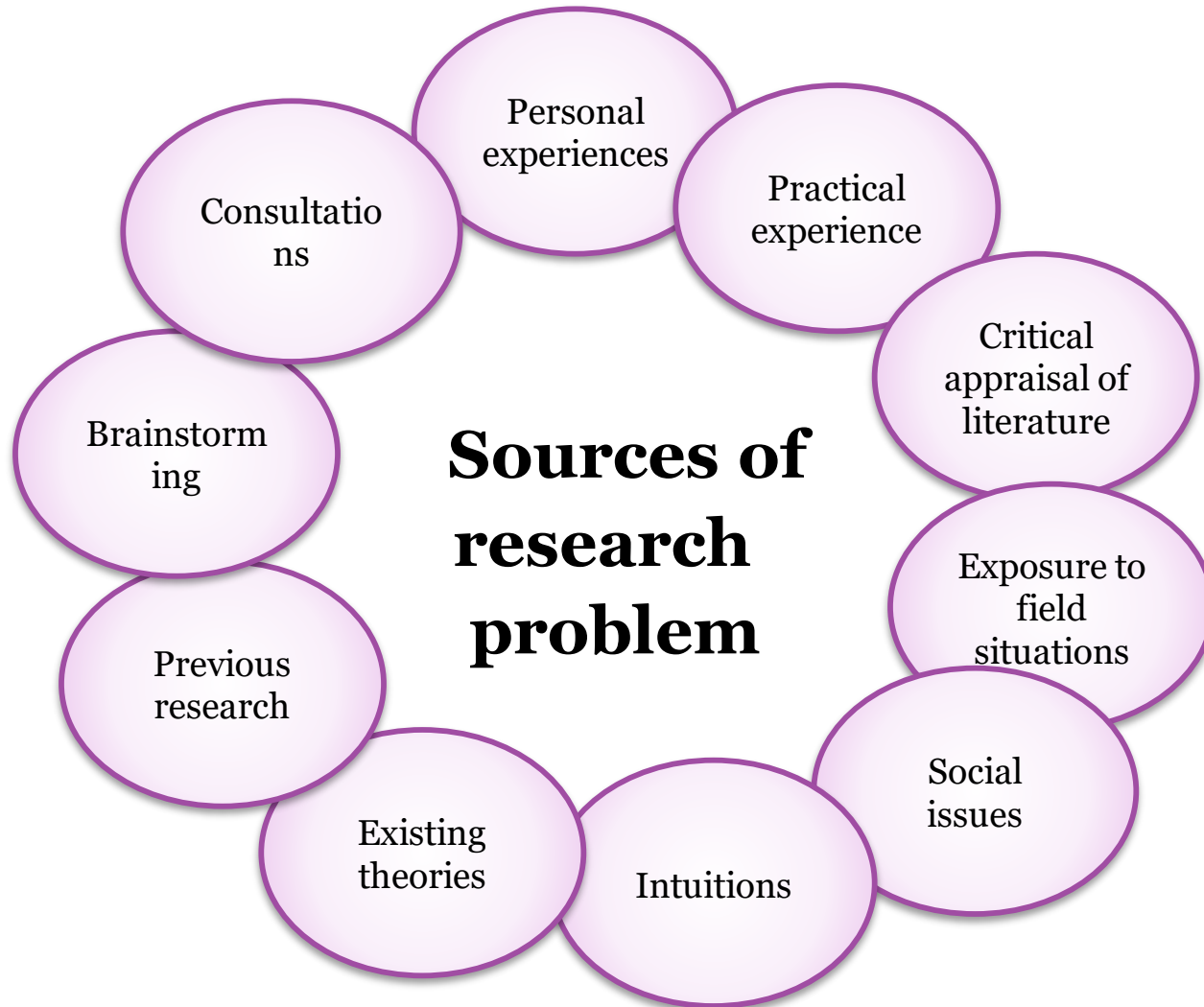
# DEFINITIONS

- A research problem is an enigmatic, troubling area or topic which needs an enquiry to get better understanding or ultimate solution.
- A problem is an interrogative sentence or statement that asks what relation exists between two or more variables.  
- **Kerlinger**
- A situation for which we have no ready and successful response by instinct or by previous acquired habit. We must find out what to do.  
- **R. S. Woodworth**

# IDENTIFICATION OF RESEARCH PROBLEM

- Identification of research problem is the first and most important step in research process.
- Generally, a broad area is selected and then a broad topic is delimited or narrowed down to a specific one-sentence statement of the problem.

# SOURCES OF RESEARCH PROBLEM



# CRITERIA FOR SELECTING A GOOD RESEARCH PROBLEM

## ❑ **Significance to nursing profession**

- A research problem could be considered significant for nursing profession if it fulfills the following criteria:
  - ❖ Nursing profession and patients, nurses, and health care fraternity will benefit from the study.
  - ❖ The results will improve clinical nursing practices.
  - ❖ Promotes nursing theory development or testing.
  - ❖ Provides solutions of current nursing practice needs.
  - ❖ Generate information to get practical implications for nursing profession.

## ❑ **Original**

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## **Feasible**

➤ Time

➤ Cost

➤ Equipment and supplies

- What is the equipment that will be needed?
- Is this equipment available and in proper working order?
- Is there a qualified operator of the equipment?
- Are the necessary supplies available or can they be obtained?

➤ Administrative support

➤ Peer support

➤ Availability of subjects

➤ Researcher's competence

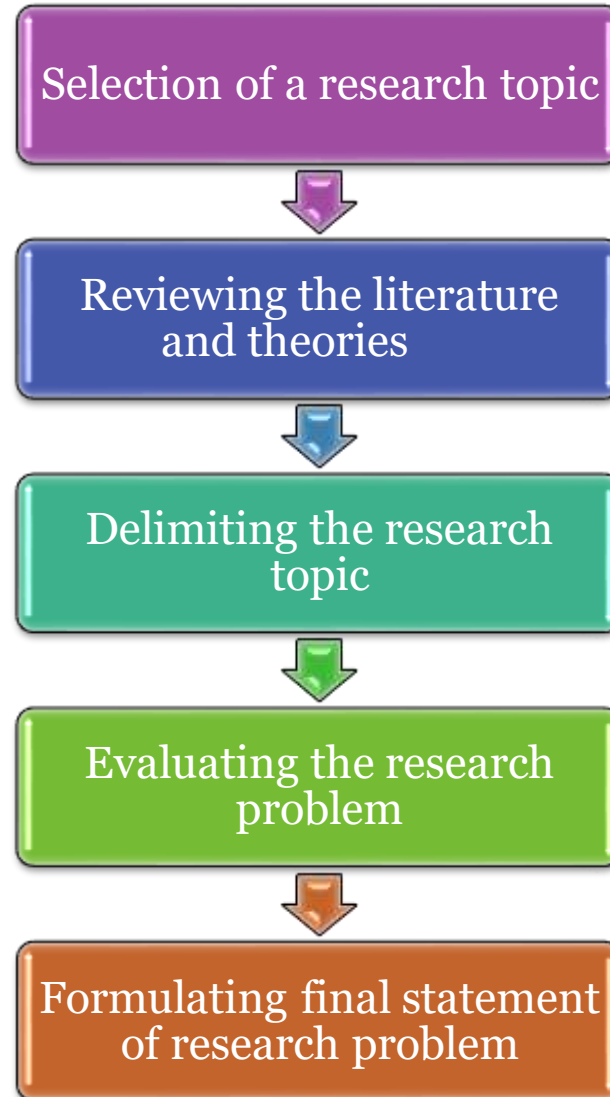
➤ Ethical considerations

**Solvable/Researchable**

**Current**

**Interesting**

# FORMULATION OF RESEARCH PROBLEM



## Formulating final statement of research problem

❖ **Declarative format:** In this format, a research problem is stated in declarative statement.

For example:

- “A descriptive study on prevalence of bedsores among unconscious patients admitted in intensive care units of PGIMER, Chandigarh.”
- “An exploratory study on contributing factors of maternal mortality in selected rural communities of district Ludhiana, Punjab.”

**Contd...**

❖ **Interrogative format:** In interrogative format, a research problem is stated in question form.

For example:

- What is the influence of the level of hemoglobin on pin site infection among patients with external skeletal fixators admitted in orthopedic wards of AIIMS, New Delhi?”
- What is the effect of ginger on morning sickness on pregnant women in selected urban communities of district Hissar, Haryana?”

The choice of these two types of format for formulation of a research problem depends on the researcher's preference and institutional policies.

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However, for the formulation of a research problem it is preferable if it fulfils the following features:

- Research problem is clearly, precisely, and concisely articulated.
- It clearly states the variables, population, and research setting under the study.
- Variables are expressed in measurable terms.
- The type of study also may be included in the statement of research problem.

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## Example:

“A descriptive study on the prevalence of pin site infection among patients with external skeletal fixators admitted in orthopedic wards of Nehru Hospital, PGIMER, Chandigarh.”

- It is an example of declarative form of the statement of a research problem, where it precisely and concisely stated and includes most of the required components of a research statement, which are:
  - ❑ *Research study type*- Descriptive
  - ❑ *Variable(s)*- It has only one research variable ‘prevalence of pin site infection.’
  - ❑ *Population*- Patients with external skeletal fixation.
  - ❑ *Research setting*- Orthopedic wards of Nehru Hospital, PGIMER, Chandigarh

# RESEARCH OBJECTIVES



# MEANING OF RESEARCH OBJECTIVES

- A research objective is clear, concise, declarative statement, which provides direction to investigate the variables.
- Research objectives are the results sought by the researcher at the end of the research process, i.e. what the researcher will be able to achieve at the end of the research study.



# CHARACTERISTICS OF RESEARCH OBJECTIVES

- Research objective is a concrete statement describing what the research is trying to achieve. A well-worded objective will be SMART, i.e.,
  - **S - Specific**
  - **M- Measurable**
  - **A - Attainable**
  - **R - Realistic**
  - **T - Time-bound**
- Research objective should be **R**elevant, **F**easible, **L**ogical, **O**bservable, **U**nequivocal, and **M**easurable.
- Objective is a purpose that can be reasonably achieved within the expected timeframe and with the available resources.
- The objective of research project summarizes what is to be achieved by the study.
- The Research objectives are the specific accomplishments the researcher hopes to achieve by the study.
- The objectives include obtaining answers to research questions or testing the research hypotheses.

# NEED OF RESEARCH OBJECTIVES

The formulation of research objectives will help the researcher to:

- Focus
- Avoid
- Organize
- Directions

# TYPES OF RESEARCH OBJECTIVES

- ❑ **General objectives:** are broad goals to be achieved.
  - The General objective of the study states what the researcher expects to achieve by the study in general terms.
  - General objectives are usually less in number.
  
- ❑ **Specific objectives:** are short term and narrow in focus.
  - General objectives can be broken into small logically connected parts to form specific objectives.
  - The specific objectives are more in number and they systematically address various aspects of problem as defined under 'the statement of problem' and the key factor that is assumed to influence or cause the problem.
  - They should specify *what* the researcher will do in the study, *where* and for *what purpose*.

## **Example:**

**Research statement:** ‘a quasi-experimental study on the effects of ginger on morning sickness among pregnant women in selected cities of Kerala.’

**General objective:** The general broad-based objective of this study is:

- To assess the effects of ginger on morning sickness in pregnant women.

**Specific objectives:** The general objective will be split into the following specific objectives:

- To determine the prevalence of morning sickness in pregnant women.
- To compare the severity of morning sickness in primigravida and multigravida.
- To compare the effects of ginger on morning sickness in primigravida and multigravida.
- To identify the relationship of effectiveness of ginger on morning sickness with age and dietary habits of pregnant women.
- To compare the effectiveness of ginger on morning sickness in working and non-working pregnant women.
- To determine the fetotoxic effects of ginger.

# METHOD OF STATING OBJECTIVES

- The objectives should be presented briefly and concisely.
  - They cover the different aspects of the problem and its contributing factors in a *coherent* way in a *logical sequence*.
  - The objectives are *clearly phrased in operational terms*, specifying exactly what researcher is going to do, where and for what purpose.
  - They are *realistic* considering local conditions.
  - Use action verbs that are specific enough to be *evaluated*.
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- Examples of action verbs are: to assess, to identify, to find out, to determine, to compare, to find, to verify, to calculate, to describe, to analyze, to establish etc.
  - Avoid the use of vague non action verbs such as: to appreciate, to understand, to study etc.

# VARIABLES



## DEFINITION

- Variables are concepts at different level of abstraction that are concisely defines to promote their measurement or manipulation within the study.
  - **Chinn and Kramer**

# CLASSIFICATION

- **Independent and dependent variables:** These are 2 variables which are interrelated and mainly observed in correlational, interventional, pre-experimental, quasi-experimental, and experimental research studies.
- **An independent variable:** It is a stimulus or activity that is manipulated or varied by the researcher to create the effect on the dependent variable.
- **A dependent variable:** It is the outcome due to the effect of the independent variable, which researcher wants to predict or explain.



For example:

- A quasi-experimental study on effect of 4-hourly chlorhexidine mouthwash on prevention of ventilator-associated pneumonia (VAP) among patients admitted in selected ICU's of DMCH, Ludhiana, Punjab.
- In this study, 4-hourly chlorhexidine mouthwash is an independent variable and ventilator-associated pneumonia (VAP) is the dependent variable.

# RESEARCH VARIABLE

- Research variables can be defined as qualities, attributes, properties, or characteristics which are observed or measured in natural setting without manipulating and establishing cause-and-effect relationship.

For example:

- An exploratory study on factors contributing to sleep disturbance among patients admitted in selected intensive care units of AIIMS, New Delhi.
- In this research study, '*factors contributing to sleep disturbance*' is a research variable which is observed in natural setting without manipulating it.

# DEMOGRAPHIC VARIABLES

- In most of the research studies, researchers make the attempt to study the sample characteristics and present them in research findings.
- In addition, sometimes researchers even try to establish relations of the demographic variables with the research variables.
- These characteristics and attributes of the study subjects are considered as demographic variables.
- Common demographic variables are age, gender, educational status, religion, social class, marital status, habitat, occupation, income, and medical diagnosis etc.

# EXTRANEOUS VARIABLES

- Extraneous variables are the factors which are not the part of the study but may affect the measurement of the study variables.

Example:

- ‘A study to assess the effect of two different pin care protocols on prevention of pin site infection among patients with external skeletal fixation.’
- In this study, pin site care protocols are independent variables and pin site infection is the dependent variable.
- However, the dependent variable, pin site infection may also be influenced by some of the other factors such as low hemoglobin level or higher blood sugar level among these patients; these factors are considered as *extraneous variables*.

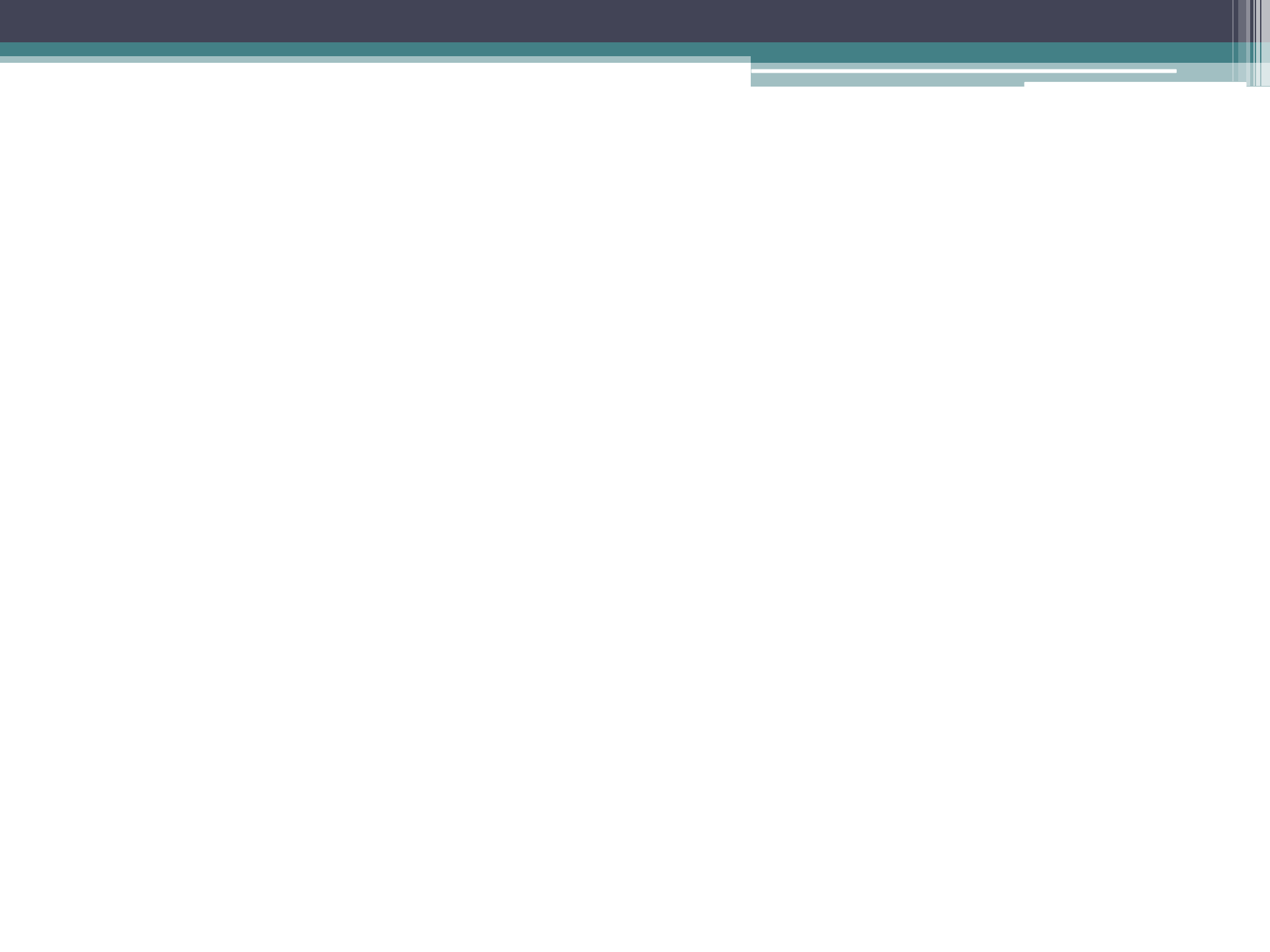
# HYPOTHESIS

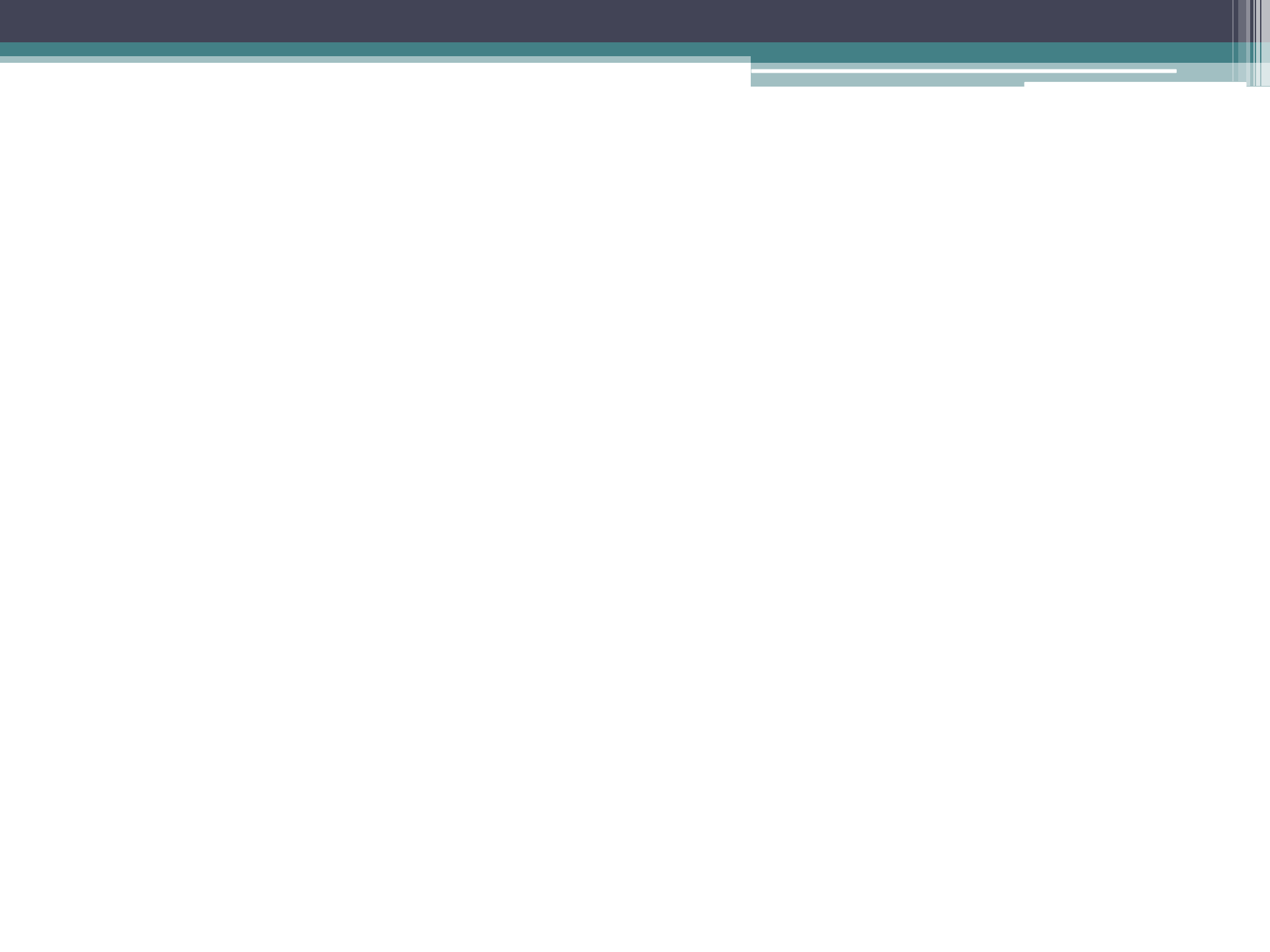
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# DEFINITIONS

- Hypothesis is a tentative prediction or explanation of the relationship between two variables.
- A hypothesis is an assumption statement about the relationship between two or more variables that suggest an answer to the research question.
- Hypothesis is a shrewd guess or inference that is formulated and provisionally adopted to explain observed facts or conditions and to guide in further investigation.

- Good and Hart







# REVIEW OF LITERATURE

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# MEANING OF LITERATURE REVIEW

- A literature review is a body of text that aims to review the critical points of knowledge on a particular topic of research.  
**- ANA, 2000**
- A literature review is an account of what has been already established or published on a particular research topic by accredited scholars and researchers.  
**- University of Toronto, 2001**
- Literature review is defined as a broad, comprehensive, in depth, systematic and critical review of scholarly publication, unpublished printed or audio visual material and personal communications.  
**- S.K. Sharma, 2005**

# IMPORTANCE OF LITERATURE REVIEW

- Identification of a research problem and development or refinement of research questions.
- Generation of useful research questions or projects/activities for the discipline.
- Orientation to what is known and unknown about an area of inquiry to ascertain what research can best contribute to knowledge.
- Determination of a need to replicate a prior study in different study settings or different samples or sizes of different study populations.
- Identification of relevant theoretical or conceptual framework for research problem.

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# IMPORTANCE OF LITERATURE REVIEW

- Identification or development of new or refined clinical interventions to test through empirical research.
- Description of the strengths and weaknesses of design/methods of inquiry and instruments used in earlier research work.
- Development of hypothesis to be tested in a research study.
- Helps in planning the methodology of the present research study.
- It also helps in development of research instruments.
- Identification of suitable design and data collection methods for a research study.
- Assistance in interpreting study findings and in developing implications and recommendations.

# PURPOSES OF LITERATURE REVIEW

- Place each in the context of its contribution to the understanding of subject under review.
- Describe the relationship of each study to other research studies under consideration.
- Identify new ways to interpret and shed light on any gaps in previous research.
- Resolve conflicts amongst seemingly contradictory previous studies.
- Identify areas of prior scholarship to prevent duplication of effort.
- Point a way forward for further research.
- See what has and has not been investigated.

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# PURPOSES OF LITERATURE REVIEW

- Develop general explanation for observed variations in a behavior or phenomenon.
- Identify potential relationships between concepts and to identify researchable hypothesis.
- Learn how others have defined and measured key concepts.
- Identify data sources that other researchers have used.
- Develop alternative research projects.
- Discover how a research project is related to the work of others.
- Place one's original work (in case of thesis or dissertation) in context of the existing literature.

# SOURCES OF LITERATURE REVIEW

Literature can be reviewed from two main sources:

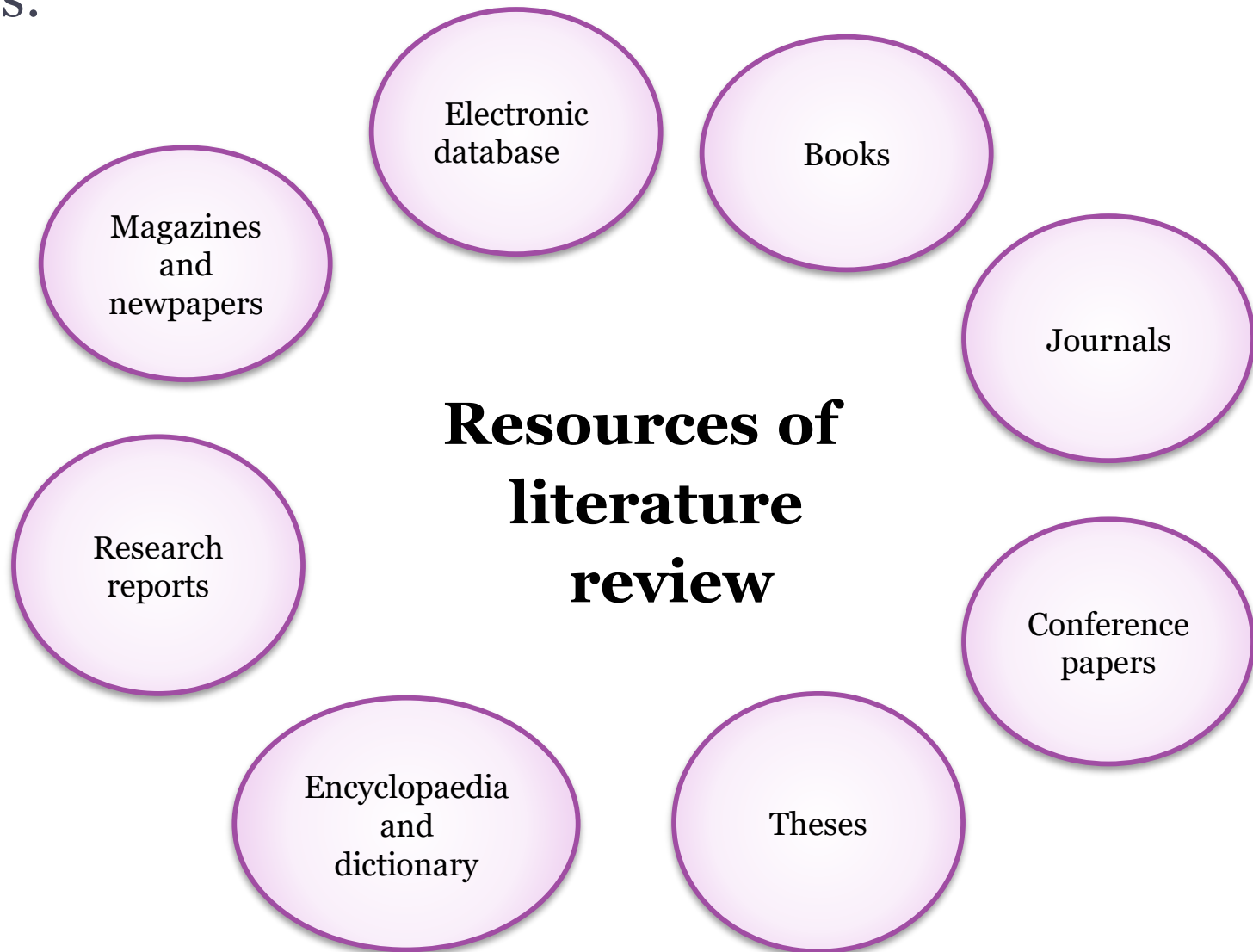
## **Primary sources:**

- A primary source is written by a person who developed the theory or conducted the research, or is the description of an investigation written by the person who conducted it.
- Most primary sources are found in published literature.
- Ex: a nursing research article.

## **Secondary sources:**

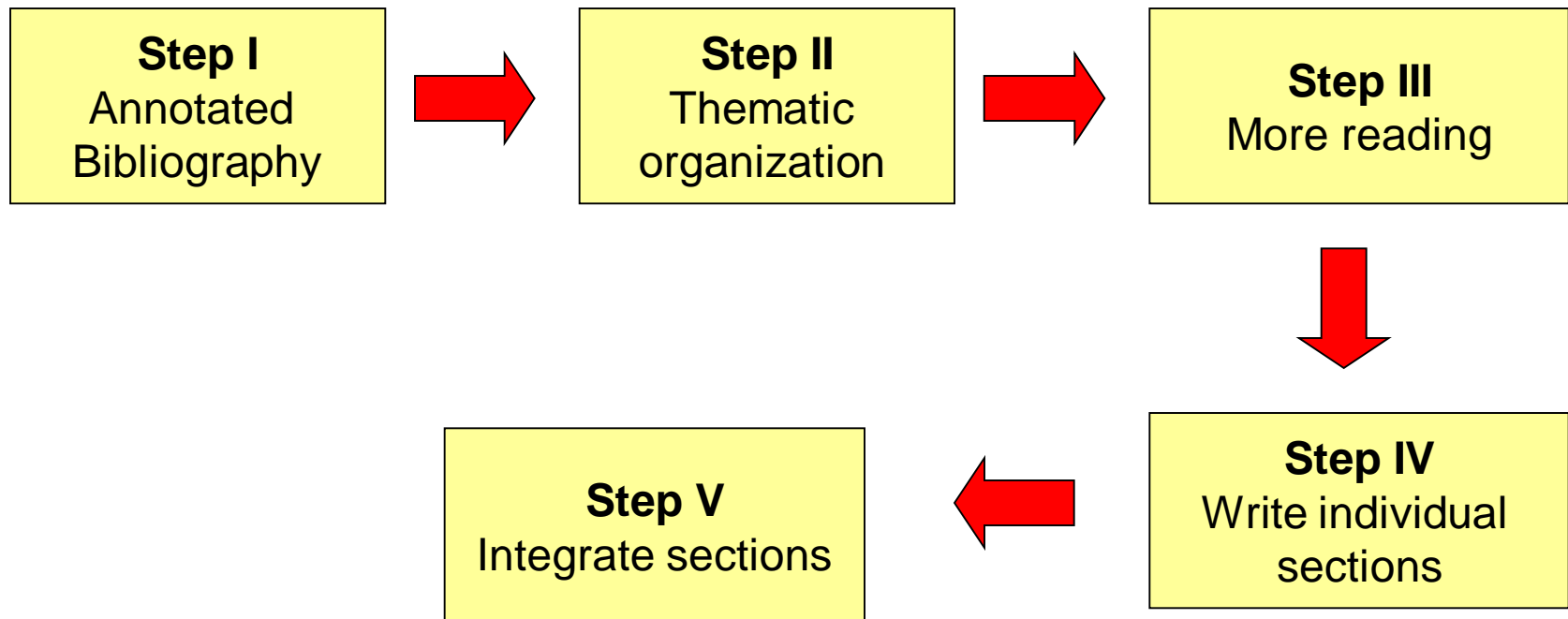
- Secondary source research documents are description of studies prepared by someone other than the original researcher.
- They are written by people other than the individuals who developed the theory or conducted the research.

The main sources of literature review can be searched as follows:



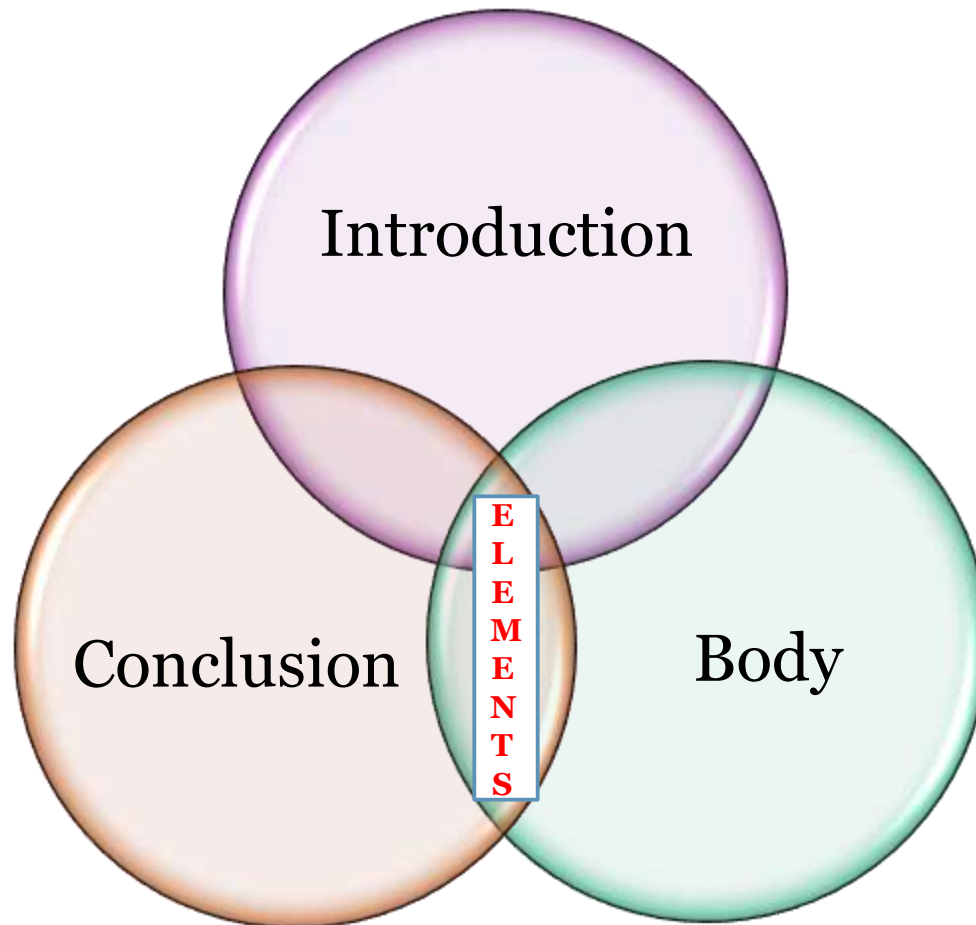


# STEPS OF LITERATURE REVIEW



# PREPARING WRITTEN LITERATURE

- There are three elements of written literature:



# POINTS TO BE CONSIDERED FOR LITERATURE REVIEW

- Be specific and be succinct
- Be selective
- Focus of current topics
- Ensure evidence for claims
- Focus on sources of evidences
- Account of contrary evidences
- Reference citation
- Organization of literature review
- Referring original source
- Avoid abbreviations
- Simple and accurate sentence structure

