Research methodology and Bio-statistics

Selection of Research Topic



What is a Research Topic?

- A research topic is the specific subject or issue that a researcher wants to study or investigate.
- In pharmacological screening, this could relate to testing new drugs, understanding how certain compounds work, or comparing drug effects.

How to Select a Research Topic?

1. **Interest and Curiosity**
   - ➢ The researcher should choose something they are genuinely curious about.
   - ➢ It keeps them motivated during long-term research.
2. **Relevance to the Field**
   - ➢ The topic must be related to the field of pharmacology or drug testing.
   - ➢ For example, it could focus on discovering anti-inflammatory effects of a new compound.
3. **Availability of Resources**
   - ➢ The researcher should have access to the required equipment, animals, chemicals, and lab facilities needed to perform the experiments.
4. **Novelty and Innovation**
   - ➢ The topic should explore something new or offer a new way of solving an existing problem.

- It should not simply repeat what has already been done unless there's a strong reason for re-validation.

5. **Feasibility and Ethics**
   - The project should be doable within time, budget, and ethical boundaries.
   - For example, some experiments on animals or humans need proper ethical approval.
6. **Literature Gap**
   - The researcher should find a gap in existing research – something that hasn't been studied yet or is not well understood.

Example in Pharmacological Screening:

- A researcher might choose a topic like: "Evaluation of anti-anxiety activity of a newly synthesized herbal compound in mice."

Review of Literature

What is Literature Review?

- A literature review is a process where the researcher reads and studies previously published research work related to their topic.
- It helps them understand what has already been done, what is known, and what questions are still unanswered.

Why is it Important?

- **Avoid Duplication:** It prevents the researcher from doing the same work that has already been done.
- **Identify Knowledge Gaps:** Helps find what areas need more research.
- **Develop Hypothesis:** Provides information to build a research question or hypothesis.
- **Design Better Studies:** Helps to learn from others' methods and results, so the researcher can design a more effective and accurate study.

Sources of Literature:

- **Scientific Journals:** Such as *Indian Journal of Pharmacology*, *Nature*, *Journal of Ethnopharmacology*, etc.
- **Textbooks:** Standard pharmacology books like *Goodman & Gilman*, *Rang & Dale*.
- **Online Databases:** PubMed, ScienceDirect, Scopus, Google Scholar, etc.
- **Theses and Dissertations:** From university libraries.

How to Perform a Literature Review:

1. **Search Using Keywords:** Use specific terms related to the topic.

2. **Select Relevant Articles:** Read abstracts and pick full papers that are useful.
3. **Summarize Findings:** Note down important results, methods, and gaps.
4. **Organize Information:** Make a structured summary to refer during the study.

Example in Pharmacological Screening:

- For the topic "Evaluation of anti-anxiety activity of a new herbal compound," the researcher would look for past studies on anti-anxiety drugs, herbal medicines with similar properties, and experimental models used to test such drugs in animals.

Research Hypothesis

- A **research hypothesis** is a proposed explanation or prediction that sets the direction for scientific research.
- It is tested through experiments or observations.

Types of Hypotheses:



1. **Null Hypothesis (H_0):**
   - States that there is **no effect** or **no difference**.
   - **Example:** "The new herbal compound has no anti-anxiety effect."
2. **Alternative Hypothesis (H_1 or Ha):**
   - States that there **is an effect** or **a difference**.
   - **Example:** "The new herbal compound has significant anti-anxiety effect."

Purpose of Hypotheses:

- The goal of an experiment is to **collect data** that either:
  - **Rejects the null hypothesis** (indicating a significant effect), or
  - **Fails to reject the null** (no significant evidence of an effect).

Study Design

- A **study design** is the detailed plan or blueprint for conducting research.
- It ensures valid, unbiased, and reproducible results.

First Hope

FREE PREVIEW

Click here to visit our website

PHARMACY PREMIUM NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.