Data Collection Methods

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Course: **RESEARCH METHODOLOGY/BIOSTATISTICS** (MA 322)

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Outline

- What is Data collection.
- Types of Data.
- Methods of Data Collection.
- Data Collection Tools.
- Challenges in Data Collection

Objectives

❖ By the end of this lecture, students should be able to:

1. Define data collection and explain its importance in research.
2. Differentiate between primary and secondary data.
3. Identify and describe different data collection methods.
4. Provide appropriate examples for each method.
5. Recognize factors that influence the choice of data collection method.

❑ What is. Data collection?

- Is the **systematic process of gathering information** relevant to a research question or hypothesis

- It is essential because the **quality of data determines the accuracy**, **reliability**, and **validity** of the research findings.

- Example: In a study on smoking habits among university students, data collection helps determine **how many students smoke**, **how often**, and **why**.

❑ Types of Data:

❖ Based on Nature of the Data:

- **Quantitative Data**: Numerical data, measurable, e.g., height, weight, age, income.

- **Qualitative Data**: Descriptive data, non-numerical, e.g., opinions, feelings, experiences.

❖ Based on Source of the Data:

- **Primary Data**: Data collected directly by the researcher for a specific study.

- Examples: Survey responses, interview transcripts, laboratory experiments.

- **Secondary Data**: Data collected by someone else and used by the researcher for analysis.

- Examples: Census data, hospital records, published articles, government reports.

❑ Methods of Data Collection

❖ A. Primary Data Collection Methods:

1. Observation Method.

2. Interview Method.

3. Questionnaire/Survey Method.

4. Experiment Method

5. Focus Group Discussion

6. Case Study Method

❖ B. Secondary Data Collection Methods:

1. Document/Record Analysis.

2. Published Sources.

3. Online Databases & Big Data.

❖ A. Primary Data Collection Methods:

1. Observation Method.

- Researcher records behaviors or events as they occur.
- **Types:**
- Participant observation (researcher participates).
- Non-participant observation (researcher only observes).
- Example: Observing patient hygiene practices in hospitals.

2. Interview Method

- Direct interaction between interviewer and respondent.
- **Types:**
- Structured (fixed set of questions).
- Semi-structured (guided but flexible).
- Unstructured (informal, conversational).

✓ Example: Interviewing farmers about the challenges of fish farming.

3. Questionnaire/Survey Method

- Written/online/phone-based sets of questions.
- Suitable for large populations.
- Example: Surveying 1,000 students about their study habits.

4. Experiment Method

- Researcher manipulates variables to study cause-effect relationships.

- Example: Testing the effect of water salinity on tilapia growth.

5. Focus Group Discussion:–

- Small group of people (6–12) discuss a topic with a moderator.
- Example: A focus group of parents discussing childhood vaccination.

6. Case Study Method:–

- In-depth study of a single case, event, or organization.
- Example: Studying the management system of one successful aquaculture farm.

❖ B. Secondary Data Collection Methods:

1. Document/Record Analysis.

- Using existing official records.
- Example: Reviewing hospital admission records for malaria trends.

2. Published Sources

- Books, journals, government reports, online databases.
- Example: Using WHO reports to study global maternal mortality rates.

3. Online Databases & Big Data:–

- Digital sources, statistical agencies, social media, etc.
- Example: Analyzing World Bank data for economic trends.

❑ Data Collection Tools:

A) Questionnaires/Survey Forms

B) Interview Guides

C) Observation Checklists

D) Measurement Instruments (scales, sensors, etc.)

❖Considerations for Choosing Data Collection Methods:

- Research objective: What do you want to find out?
- Type of data needed: Qualitative or quantitative?
- Resources: Time, money, personnel available.
- Respondent availability and willingness
- Accuracy and reliability

❖ Challenges in Data Collection:

- Bias (sampling bias, response bias)
- Non-response or incomplete data
- Privacy and ethical issues
- Data quality and accuracy

References

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Thanks