

BISHNUPUR PUBLIC SCHOOL AND COLLEGE OF NURSING

VII SEMESTER, B SC, UNIT-VII, SUB: NURSING RESEARCH AND STATISTICS

BY Dr Koushik Pal

Introduction to Statistics:

Statistics is a branch of mathematics that deals with collecting, organizing, presenting, analyzing, and interpreting data. In nursing and health sciences, statistics helps in understanding patient data, planning care, and improving research quality.

Definition of Statistics

Statistics is defined as:

- “A science that deals with the collection, classification, presentation, analysis and interpretation of numerical data.”

Another simple definition:

- “Statistics is the study of data: how to collect it, analyze it, and make decisions based on it.”

Uses of Statistics

Statistics plays an important role in healthcare, nursing education, management, and research.

1. In Nursing Practice

- Helps in assessing patient conditions using measurable data (BP, pulse, temperature, lab values).
- Useful for evidence-based practice.
- Helps evaluate the effectiveness of nursing interventions.

2. In Research

- Identifies health problems through data.
- Helps develop hypotheses and draw conclusions.
- Guides decision-making based on data analysis.

3. In Hospital & Public Health

- Helps monitor disease patterns, outbreaks, and health indicators.

- Useful in planning health programs and allocating resources.

4. In Education

- Evaluation of students' performance.
- Helps in curriculum improvement through data-based decisions.

5. In Administration

- Helps in quality control, budgeting, and forecasting.
- Supports policy making and performance evaluation.

Scales of Measurement

Scales of measurement describe how data is categorized, ordered, or quantified. They determine what type of statistical tests and graphs can be used.

There are four main scales:

1. Nominal Scale (Naming / Categories)

- Data placed into categories without any order.
- No numerical meaning.
- Used for classification.

Examples:

- Gender (Male/Female)
- Blood group (A, B, O, AB)
- Marital status
- Type of disease

2. Ordinal Scale (Order / Ranking)

- Data arranged in order, but differences between ranks are not measured.
- Shows relative position.

Examples:

- Pain scale (mild, moderate, severe)
- Socioeconomic status (low, middle, high)

- Class ranking (1st, 2nd, 3rd)

3. Interval Scale (Equal intervals, No true zero)

- Numeric scale with equal intervals between values.
- Zero does not represent absence (no true zero).

Examples:

- Temperature in Celsius or Fahrenheit
- IQ scores

4. Ratio Scale (Equal intervals + True zero)

- Most precise scale.
- Has equal intervals and a true zero.
- Allows all mathematical operations.

Examples:

- Height, weight
- Pulse rate, BP
- Age
- Income

SHORT NOTES

1. Introduction to Statistics (Short Note)

Statistics is the science of collecting, organizing, presenting, analyzing, and interpreting data. It helps in understanding trends, making decisions, and solving problems based on numerical information. In healthcare and nursing, statistics supports clinical assessment, research, and administrative planning.

2. Definition of Statistics (Short Note)

Statistics can be defined as:

- “A science that deals with the collection, classification, analysis, and interpretation of data.”

It provides tools to summarize large amounts of information meaningfully.

3. Uses of Statistics (Short Note)

- Helps in research and evidence-based practice.
- Assists in public health planning and disease surveillance.
- Supports clinical decision-making using patient data (BP, temperature, lab values).
- Useful in hospital administration for budgeting, quality control, and forecasting.
- Helps in educational evaluation and curriculum improvement.

4. Scales of Measurement (Short Note)

There are four scales:

1. Nominal – categories (gender, blood group).
2. Ordinal – ranking/order (pain scale, SES).
3. Interval – equal intervals, no true zero (temperature in °C).

4. Ratio – equal intervals + true zero (height, weight, age).

 OBJECTIVE TYPE QUESTIONS

A. Multiple Choice Questions (MCQs)

1. Statistics is mainly concerned with:

- a) Words
- b) Numbers
- c) Stories
- d) Pictures

Answer: b) Numbers

2. Which is NOT a function of statistics?

- a) Data collection
- b) Data interpretation
- c) Data cooking
- d) Data analysis

Answer: c) Data cooking

3. Which scale has categories without order?

- a) Ordinal
- b) Ratio
- c) Nominal
- d) Interval

Answer: c) Nominal

4. Temperature in Celsius is measured on which scale?

- a) Ratio
- b) Interval
- c) Ordinal
- d) Nominal

Answer: b) Interval

5. Weight and height belong to which scale?

- a) Nominal
- b) Ordinal
- c) Interval
- d) Ratio

Answer: d) Ratio

6. Pain level (mild, moderate, severe) is an example of:

- a) Interval
- b) Ordinal
- c) Ratio
- d) Nominal

Answer: b) Ordinal

7. Which scale has a true zero?

- a) Nominal
- b) Interval
- c) Ratio
- d) Ordinal

Answer: c) Ratio

8. Blood group is an example of:

- a) Ratio
- b) Interval
- c) Ordinal
- d) Nominal

Answer: d) Nominal

9. Which is the highest level of measurement?

- a) Nominal
- b) Ordinal
- c) Interval
- d) Ratio

Answer: d) Ratio

10. Statistics helps in:

- a) Decision-making
- b) Guesswork
- c) Confusion
- d) None

Answer: a) Decision-making

B. Short Answer Questions (2–3 marks)

1. Define statistics.

Statistics is the science of collecting, organizing, analyzing, and interpreting numerical data.

2. Name four uses of statistics.

Research, planning, clinical decision-making, and public health surveillance.

3. What is a nominal scale?

A scale of measurement that categorizes data without any order (e.g., gender, blood group).

4. What is an ordinal scale?

A scale that shows order or ranking but does not show equal differences between ranks.

5. What is interval scale? Give example.

A scale with equal intervals between values but no true zero. Example: temperature in °C.

6. What is ratio scale?

A scale with equal intervals and a true zero. Example: weight, height.

7. Mention two uses of statistics in nursing.

Assessment of patient data and evaluation of health outcomes.

8. What is data?

Data refers to raw facts, figures, or information collected for analysis.

9. Name the four levels of measurement.

Nominal, Ordinal, Interval, Ratio.

10. Give one difference between interval and ratio scales.

Interval scale has no true zero; ratio scale has a true zero