

Name Muhammad Saeed
I D 13910
Department BS-Dental
Assignment Research Methodology
Submitted to Atta Ullah Sir
Date 23-6-2020.

Page 1

Q18 Nine students take a test. Their Scores out of hundred, 100 are: 50, 79, 70, 48, 90, 68, 89, 92, 77. Find out of the mean, Median, and mode of their Scores.

Ans

⇒ **Mean**

$$48, 50, 68, 70, 77, 79, 89, 90, 92 = \frac{663}{9}$$

$$\text{Mean} = \frac{663}{9} = 73.66$$

⇒ **Mode = No Mode**

⇒ **Median = 48, 50, 68, 70, 77, 79, 89, 90, 92**

↓

77

Median = 77

Short note Presentation of data

Q No 2 :

08 Presentation of data :-

This refers to the organization of data into tables, graphs, or charts, so that logical and statistical conclusion be derived from the collected measurements.

∴ Data may be presented in 3 methods :-

⇒ Textual

⇒ Tabular OR

⇒ Graphical

⇒ **Tabular Presentation**

→ Method of presenting data using the statistical table.

→ A systematic organization of data in columns and rows.

⇒ **Textual Presentation**

→ The data gathered are presented in paragraph form.

→ Data are written and read.

→ It is a combination of texts and figures.

Q:3

Differentiate b/w Relative risk and Odds ratio with Examples.

Ans

(i) Relative Risk:

- * Incidence in exposed individuals
 $S = a/a+b$ or proportion of exposed. People who developed the disease.
- * Incidence in non-exposed individuals
 $S = c/c+d$ or proportion of non-exposed ~~who~~ people who developed disease.

Relative Risk = $\frac{\text{Incidence in exposed}}{\text{Incidence in non exposed}}$

$$RR = \frac{a/a+b}{c/c+d}$$

example

| | CHD+ | CHD- | Total |
|------------|------|------|-------|
| Smoker | 112 | 176 | 288 |
| non Smoker | 88 | 224 | 312 |

incidence in ~~non~~ exposed = $a/a+b = 112/288 = 0.38$

incidence in non exposed = $c/c+d = 88/312 = 0.28$

$$RR = 0.38/0.28 = 1.38$$

(ii) Odds Ratio

Incidence cannot be measured in case control study because we start with the disease people (cases) and non diseased people (controlled), hence we calculated OR

Example

Case Control

| | | | |
|-------------|---|---|-----|
| Exposed | a | b | a+b |
| non Exposed | c | d | c+d |

$$OR = a/c \quad b/d \quad \text{or} \quad ad/bc$$

Page 4

Total

Total

| | | | |
|-------------|-------|-------|-----|
| Exposed | 140 a | 370 b | 510 |
| Non Exposed | 40 c | 234 d | 274 |

$$\text{Odds} = 140/40 = 3.5$$

$$\text{Odds} = 370/234 = 1.6$$

$$\text{OR} = 3.5/1.6 = \boxed{2.2}$$

Compared to the controlled the odds of being a passive smoker are 2.27 in a breast case.



Q4
ANS:

PREVALENCE

Prevalence quantifies the proportion of individuals in a population who have the disease at a specific instant and provides an estimate of the probability (Risk) that an individual will be ill at a point in time.

- The formula for calculating the prevalence $P = \frac{\text{number of existing cases of a disease}}{\text{total population (at a given point in time)}}$.

⇒ Point PREVALENCE

- Prevalence can be thought of as the status of the disease in a population at a point in time and as such is also referred to as point prevalence.

- This "Point" can refer to a specific point in calendar time or to a fixed point in the course of event that varies in real time from person to person, such as the onset of menopause or puberty or the third postoperative day.

⇒ Period PREVALENCE

- It represents the proportion of cases that exist within a population at every point during specified period of time.
- The numerator thus include that were present at the start of the period plus new cases that develop during this time. **Eg:** frequency of patients receiving psychiatric Rx between

May 31 - Dec 01 2008

Question 5

(What is Hypothesis)

Hypothesis is

A testable theory, or statement of belief used in evaluation of a population parameter of interest e.g. mean or proportion.

⇒ Steps in hypothesis Testing ⇐

(i) Choosing an appropriate statistics t test, z test for continuous data, chi square for proportions etc.

Test statistics is computed from the sample data and is used to determine whether null hypothesis should be rejected or retained.

Test statistics generates p value

(ii) Statement of research question in terms of statistical hypothesis (Null and alternate hypothesis).

(iii) Selection of an appropriate level of significance. The significance level is the risk we are willing to take that a sample which showed a difference was misleading. 5% significance level means that we are ready to take a 5% chance of wrong results.

P value: Indicate the probability or likelihood of obtaining a result at least as extreme as that observed in a study by chance alone, assuming that there is truly no association b/w exposure and outcome under consideration.

By convention the P value is set at 0.05 level. Thus any value of P less than or equal to 0.05 indicates that there is at most a 5% probability of observing an association as large or larger than that found in the study due to chance alone given that there is no association between exposure and outcome. If P value $>$ 0.05 do not reject the null hypothesis.

(iv) Performing calculation and obtaining P value.

(v) Drawing conclusions, rejecting null hypothesis if the P value is less than the set significance level.

The End