Name :- M. Usama

ID :- 13622

Programe :- BS (Dental)

Semester :- 6th

Submitted To :- Dr. Attaullah

Su paper :- Research Methoddogy

Date :- 23-6-2020

Q1:- Nine students take a test. Their scores out of 100 are:

50, 79, 70, 48, 90, 68, 89, 92, 77.

Find out the Mean, Median, and Mode of their scores.

Ans:- * Mean:

Taking Mean formula we get.

$$\bar{x} = \frac{\Sigma x}{n}$$

putting values in formula.

$$\bar{x} = \frac{50+79+70+48+90+68+89+92+77}{9}$$

$$\bar{x} = \frac{663}{9}$$

$$\boxed{\bar{x} = 73.66}$$

P-T-O

* Median :-

50, 79, 70, 48, 90, 68, 89, 92, 77.

Arranged the data in order from lowest to greatest.

48, 50, 68, 70, 77, 79, 89, 90, 92

Median = value of $\left(\frac{n+1}{2}\right)^{th}$

= value of $\left(\frac{9+1}{2}\right)^{th}$

= value of $\left(\frac{10}{2}\right)^{th}$

= value of 5^{th}

Median = 77 Ans.

* Mode :-

* No value is repeated in set of observation so mode is impossible.

Q2: Write a short note on presentation of research data?

Ansr Presentation of Data:

* Data once collected should be presented in a such a way as to be easily understaad.

* The style of ~~way~~ presentation depends, of course, on type of data.

* Data can be presented in as frequency tables, charts, graphs etc.

Frequency Table:

* In a frequency table data is presented in a tabular form. It gives the frequency with which (or the number of times) a particular

a particular value appears in the data.

	f	percent %	v-percent	commulative percent
Strongly disagree	2	2.0	2.0	2.0
Disagree	13	13.0	13.0	15.0
Average	26	26.0	26.0	41.0
Agree	26	26.0	26.0	67.0
Strongly Agree	33	33.0	33.0	100.7
Total	100	100.0	100.0	

* Graphs :-

* Another way to summarize and display data is through the use of graph or pictorial representations of numerical data. Graphs should be designed so that they convey at

a single glance the general patterns in a set of data.

* Bar charts :-

* Bar charts are used for nominal or ordinal data.

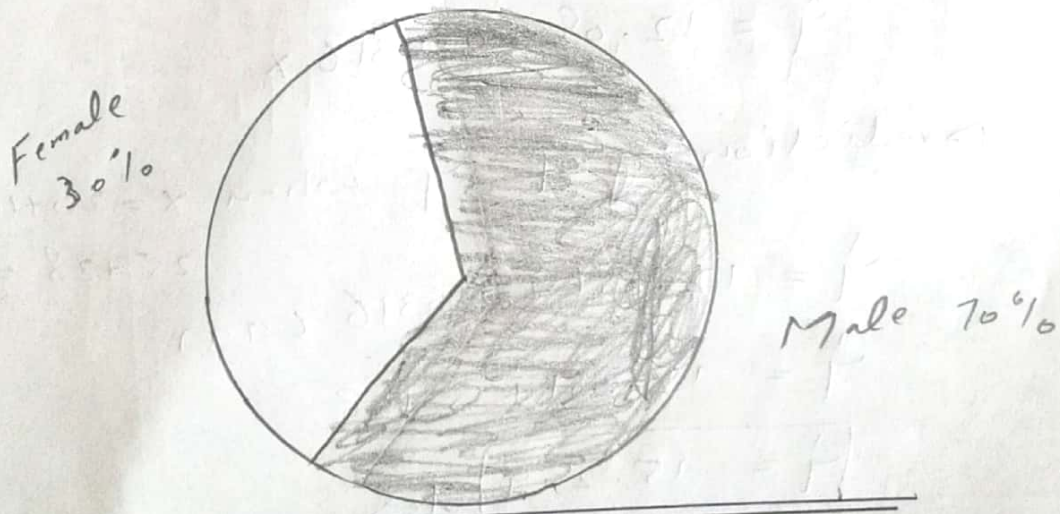
* Histogram :

  * A histogram describe a frequency distribution for quantitative data.

* pie chart :

  * pie chart can also be used to display nominal or ordinal ratio.

-> Grender Distributions.



Q3:- Differentiate between Relative risk and Odd ratio with example.

Ans:- Difference b/w Relative risk and Odd ratio :

* Odds ratio and Relative risks are often confused despite being unique concepts. The basic difference is that the Odds ratio is a ratio of two odds (yep, it's that obvious) whereas the relative risk is a ratio of two probabilities. (The relative risk is also called the risk ratio).

* Relative Risk (Cohort study) :

* Incidence in exposed individuals = a/a+b. or proportion of exposed people who developed the disease.

P-T-O

Incidence in non-exposed individuals = $C/C+d$.

or proportion of non-exposed people who develop disease.

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

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

Disease Status.

	CHD+	CHD	Total
Smoker	112	176	288
Non-Smoker	88	224	312

Now putting value in formula.

$$RR = \frac{112/112+176}{88/88+224} \Rightarrow \frac{112/288}{88/312}$$

$RR = \frac{0.38}{0.28}$ * 0.38 is incidence of smoker.
0.28 * 0.28 is incidence of non-smoker.

$$R.R = 0.38/0.28 = 1.38.$$

Interpretation of RR: Compared to non-smokers, the smokers have a 1.38 times greater risk of developing CHD.

P-T-O

* Odd Ratio :

* Incidence cannot be measured in case control studies because we start with the diseased people (cases) and non diseased people (controls), hence we calculat OR.

* The odds of an event is the number of events / the number of non-events.

E.g.: Passive Smoking and Breast cancer:

	Breast cancer	No Breast cancer	Total
Exposed.	140 (a)	370 (b)	510
Non Exposed.	40 (c)	234 (d)	274

Odds = 140/40 = 3.5 Odds = 370/234 = 1.6

OR = 3.5/1.6 = 2.2.

Compared to the control, the odds of being a passive smoker are 2.2> in Ca breast cancer.

Q4:- What is meant by prevalence in research? Also explain point and period prevalence.

Ans:- **Prevalence :-**

* Prevalance 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. OR

* The presence proportion of disease or condition in a population (generally irrespective of the duration of the disease.

* The formula for calculating prevalence P = number of existing cases of a disease / total population (at a given point in time).

P-T-O

* Period prevalence :-

* It represents the proportion of cases the exist within a population at any point during a specified period of time.

* The numerator thus includes cases that were present at the start of the period plus new cases that developed during this time.

E.g: Frequency of patients receiving psychiatric Rx blw May 31 - Dec 01 2008.

Includes existing cases on May 31, and those newly diagnosed until Dec 01.

P-T-O

* 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 events that varies in real time from person to person, such as the onset of menopause or puberty or the third postoperative day.

* At a set point in time (i.e, September 30, 1999).

Q5:- What is Hypothesis? Also explain different steps in testing of hypothesis.

Ans:- Hypothesis :-

* A testable theory, or statement of belief used in evaluation of a population parameter of interest.

E.g: Mean or population.

OR

A supposition or proposed explanation made on the basis of limited evidence as a starting point for further investigation.

P-T-O

Steps In Hypothesis Testing

① Statement of research question in terms of statistical hypothesis (Null and alternate hypothesis.

② 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.

③ Choosing an appropriate statistics t test, z test for continous data, Chi square for proportion etc. Test statistics is computed from

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

Test statistics generates p value.

p value: Indicates 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 blw 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 b/w exposure and outcomes. If p value > 0.05 do not reject the null hypothesis.

(4). Performing calculations and obtaining p value.

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

Thank you.