

EDITORIAL

Basic Guidelines for Data Analysis Technique(s)

Data analysis is back bone of research. To conclude the research findings, scientific data analysis is mandatory. Researchers in biomedical sciences should concentrate on the selection of proper data analysis technique(s). Suitable data analysis technique(s) can be selected according to the type of data and objectives of research. There are two basic types of data.

1. Qualitative or categorical data also called non-metric data (it contains nominal and ordinal measurements).
2. Quantitative or metric data (it contains ratio and interval measurements)

There are various methods of analysis for *quantitative* and *qualitative* data which are based on different objectives and hypothesis.

To see the frequency distribution of a particular problem one of the following three methods can be used.

1. Graphical Presentation
2. Frequency Table
3. Central Values

In graphical presentation histogram can be used for *quantitative* data and pie chart, bar chart, multiple bar charts may be used for *qualitative* data. For central values of quantitative data, different types of averages like mean, median, geometric mean and mode can be used. However, for *qualitative* data, use the proportion can be used as an alternative to the mean. To investigate the variation of the data the standard deviation or range can be used. To inspect the consistency of two or more data sets, coefficient of variation is used.

To compare the mean of two independent *quantitative data sets*, which are normally distributed, t-test technique can be used. To find out the efficacy of two drugs on same sample, dependent or paired sample t-test is used. Similarly chi-square is used to see the association between different attributes i.e. for *categorical* or *qualitative* data.

In health related studies, to get the relationship between two or more quantitative variables, if the assumptions satisfy, *Pearson Correlation* is used. In the case of interdependency, when dependent variable is quantitative *simple linear regression* is used. In case where dependent variable is categorical, *logistic regression* is used. If dependent variable has two categories then *Binary logistic regression* is used. When dependent variable has ordinal measurement scale, *ordinal logistic regression* is used.

It is essential for ultimate decision making in scientific research that the assumptions are clearly associated to the data analysis technique(s) and vice versa. If assumptions do not fulfill these criteria, alternative *non-parametric tests* can be used.

It is hoped that this information will be useful to the researchers.



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