

RELEVANCE OF STATISTICS IN AYURVEDA

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ABSTRACT

Statistics is a branch which deals with the collection of data, analysis, presentation and interpretation of data. *Ayurveda* is the traditional medicine system, which nourishes an individual's physical strength and intelligence along with maintaining balance with the environment. *Ayurveda* has not only given attention to health aspects but *Ayurveda Acharyas* has given a due regard to the importance of statistical methods. The statistical methods which were used by Indian *Acharyas* were in practice for a long time, but it is the need of the hour to explore them w.s.r. *Brhtrayees* and to throw light on the statistical methods that are incorporated by our *Acharyas* long ago. Data collection, types of data, central tendencies, correlation, regression, data presentation, concepts of statistics will be taken into consideration and they will be related to the concepts mentioned in *Ayurveda* w.s.r. *Brhtrayees*. Here an effort has been made to prove the essence/relevance of statistics in *Ayurveda*.

Keywords- Statistics, *Ayurveda treatises*, relevance, statistical methods.

INTRODUCTION

The quest for knowledge generates out of inquisitiveness which ultimately leads to understanding of various phenomenon. Any branch of science demands precision for its development and so does the medical science. For precision facts, observations or measurements have to be expressed in a figure which is termed as statistics¹. *Ayurveda Acharyas* had given due regards to the importance of statistical methods. The mentioning of term “*Sankhya*” and “*Maana*” in the literature of *Ayurveda* itself indicates the importance given to numbers and measurement. The statistical methods which were used by the ancient Indian seers were in practice for a long time, but it is the need of the hour to explore them

with some statistical terminologies to prove the essence of presence of statistics in *Ayurveda*. Statistics is the science of collecting and analyzing significant numerical data, numerical means to deal with numbers. In this regard all the *Brhtrayees* particularly in *Charaka Samhita* numerical value for a particular data namely five *mahabhutas*, three *doshas*, *shadupakramas*, three *rogamargas*, *astamahagadas* etc are explained² in terms of how many are they. The application of statistical methods in the field of medicine, biology and public health in planning or conducting and analyzing data which arise in investigation is called as biostatistics³.

Aim and Objectives- To analyze the concepts of statistics w.s.r *Brhatrayees*.

Materials- *Brhatrayees*.

Methods- Collection, compiling, analyzing concepts of *Ayurveda* which highlights the relevance of statistics in *Ayurveda*.

DISCUSSION

Statistics is the science of collecting and analyzing significant numerical data⁴. In the entire three treatise numerical values are used for a particular data, the relevance of statistics is well evident in the *Ayurveda* treatises. Here are some of the concepts that are collected, compiled, analyzed which proves the relevance of statistics in *Ayurveda* they are as follows-

1. DATA COLLECTION-SAMBHASHA PARISHADS.

Data collection is the collective recording of information, either numerically or in any form is called data⁵. All the *sambhasha parishads* mentioned in *Charaka Samhita* can be understood on the basis of data collection, because each *Acharya* is giving their data regarding the topic of *Sambhasha*⁶. Example - In *sambhasha parishad* of *Rasa*.

Among data, there are 2 types of data

a). **QUALITATIVE-** which is attribute, cannot be measured⁷. Qualitative data can be analyzed in *Charaka Samhita* on the basis of *sadhya, asadhya, kastasadhya* of *vyadhi*, it gives explanation about the *sadhya, asadhyata* of any *vyadhi*⁸. Here explanation is given regarding what type/kind of *vyadhi* it is.

- **QUALITATIVE-** '*sarvada sarva bhavanaam samanyam vrudhikaranam*'

Here this *shloka* speaks about the *bhavas* i.e. quality by which the *samanya vridhi* is seen.

b) **QUANTITATIVE-** which can be measured⁹. Quantitative data in *Charaka Samhita* is seen whenever the *sankhya* or the numerical counting is seen. Example - *kalpasthana* with total no of 600 *yogas* and with particular *dravya* total number of *yogas* are explained as *Madanaphala-133etc*¹⁰, along with this

number of bones, *anjali pramana* can also be understood.

- **QUANTITATIVE-** '*samanyam ekatvakarakam*'.

Here this *shloka* speaks about the quantity by which *ekatva* is obtained.

2. **CORRELATION-** Strength of association between the two variables.

Among correlation there are 2 types of correlation

1. Perfect positive correlation
2. Perfect negative correlation¹¹.

a) **Perfect positive correlation** is the correlation in which if one variable changes/increases by one unit the other variable also changes/increases by the same unit, Example - *vata dosha* increases by *vyayama*.

b) **Perfect negative correlation** is the correlation in which if one variable changes/decreases by one unit the other variable also changes/increases by the same unit, Example - *kapha dosha* decreases by *vyayama*.

3. **REGRESSION-** In two variables if one variable is known the other can be predicted¹²; if *x* is known then *y* can be predicted, in any *vyadhi* if *poorva roopa* is known then one can predict the severity of the *pratyatma laxanas*.

Example- If the *poorvarooopa* of any *vyadhi* is strong then the *laxanas* also will be strong in the same way the prognosis will also be difficult.

4. **MEDIAN-** Is the central value or mid value of any observations, also known as 50th percentile¹³, median can be understood in the concepts of *sara, samhanana, bala* etc through the basis of *uttama, madhyama, heena*. Of all these 3 components, median means the *madhyama bala, madhyama sara* etc, which gives idea between the *pravara* and *avara*¹⁴.

5. **MODE-** which occurs in maximum number of times in given set of data¹⁵, among *vata, pitta, kapha prakruti* the person who belongs to *vata prakruti* will be more prone towards *vata* related *vyadhis*.

Other few examples- Use of *madanaphala* is more when compared to all the *vamaka dravyas* mentioned in *kalpasthana* of *Charaka Samhita*.

In *shwasa vyadhi* the *shwasa kruchrata* occurs more times these are the few examples which can be understood on the basis of mode.

6. POPULATION AND SAMPLE SIZE- Population is collection of the all items. Sample is collection of the part of the population¹⁶. Population and Sample can be understood on the basis of *Lokapurusha Sidhanta*¹⁷.

In which the *loka* is entire world/population and the sample is part of the population/world.

7. ANOVA-F-test/Analysis of Variance¹⁸- Ratio of variance between the groups and variance within the groups. In any *vyadhi* one has to analyze the involvement of particular *dosha* among *tri doshas* and subtype of particular *dosha*, it is nothing but the ratio of *tridoshas* to the subtype of particular *dosha*.

Examples-In *arshas vyadhi* the involvement of *tridosha* is seen among them particularly the *vata dosha* is affected, and among the *vata dosha*, subtype of *vata dosha* i.e. *apana vata* is affected.

8. TESTING OF HYPOTHESIS- Testing of hypothesis is used to decide whether to accept or reject the hypothesis¹⁹. The sequence of testing of hypothesis is as follows-

a. Hypothesis is any tentative prediction, in any *sambhasha parishads* all the *Acharyas* states the hypothesis regarding the *sambhasha adhikarana* i.e. topic name, Example- In deciding the *rasa* all the *Acharya* kept their view regarding the *rasa*.

9. DATA PRESENTATION- Presentation of collected data in the form of graphs.

a) Qualitative data can be presented in the form of bar, multiple, pie etc. In bar diagram, y axis is represented with the *laxanas* and x axis is represented with the *nidanas*, according to the *nidana* the *laxanas* can be seen, if *vatakara nidana sevana* is done then *vataja laxanas* can be seen.

b) Pie chart in which the whole data is presented in the circle of 360 angle here the *sadhya*, *asadhya*, *yapyatva* of the *vyadhi* can be understood.

10. STATISTICS IN GROSS-In all *sambhasha parishads* the *Acharyas* come from all the sides /part of the world which can be understood as sample. All the *Acharyas* kept their view regarding the *adhikarana* or topic of *sambhasha* which can be understood as hypothesis and also in the form of data collection, *Atreya* does the testing of hypothesis with all proper reasoning and gives the conclusion as whether to accept or reject the hypothesis given by all the *Acharyas*.

11. NORMAL DISTRIBUTION- Normal distribution is the distribution in which mean, median, mode coincides²⁰. *Swastha lakshanas* can be correlated here as *samadosha*, *sama agni sama dhatu*²¹, where the *samatva* of the *dosha*, *dhatu*, *agni* is seen.

CONCLUSION

By reading the *Ayurveda treatises* with keen observation, with proper understanding it reveals the relevance of statistics in *Ayurveda*, also how scientific the treatises are written by *Ayurveda Acharyas*, it also gives the evidence to the society about the scientific precise approach towards *Ayurveda*.

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Source of Support: Nil

Conflict Of Interest: None Declared

How to cite this URL: Manjula & Shreevathsa: Relevance Of Statistics In Ayurveda. International Ayurvedic Medical Journal {online} 2018 {cited December, 2018} Available from:
http://www.iamj.in/posts/images/upload/2398_2401.pdf