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Need and scope of standardization of scoring for clinical symptoms described in Ayurveda

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Abstract:

Background: Statistics is a branch of modern science which is utilized to find out whether the applied interventions or a change in any observation is due to chance or is an actual effect of intervention. Thus analysis of data of clinical studies through various statistical tests is must for drawing scientific conclusions. However, there are huge differences in methodology of statistical analysis in Ayurveda researches which are mostly because of different gradation of symptoms, incomplete description of statistical procedures and emphasis only on descriptive statistics.

Methodology: Statistical data presented in various published clinical researches in indexed journal was comparatively studied and was also compared with requirements of parametric and non-parametric statistical tests. Therefore, present review was done to present various aspects related to standardization of scoring of symptoms and its future scope for globalization of Ayurveda researches. **Results and conclusion:** According to statistics, Ayurveda clinical symptoms are qualitative data and thus it can be analyzed wither by descriptive statistics or by non-parametric test (if ranked). However, both these statistical measures are not enough strong to establish scientific ground for Ayurveda researches. Parametric tests is the only way to have strong evidence and this can only be performed if proper scoring/gradation pattern of Ayurveda symptoms is established. WHO-DFC sponsored project on Developing Guidelines for Clinical Research Methodology in Ayurveda is needed to be implemented to maintain uniformity in Ayurveda clinical researches.

Key Words: Standardization, Scoring, WHO, Statistical tests

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Introduction:

As being one of oldest health science in human history, Ayurveda basically stands on the pillars of strong experience based conceptual theories and has been expressed in accordance with observation in natural phenomenon. Because of this, Ayurveda concepts include prime elements such as Air, Water, Fire, Soil and Space, combined in a single term known as *Panchamahabhuta*. However Ayurveda is not just science of concepts, it has strong ground of scientific observations. This is evident from the types of disease, symptoms of various diseases, causative factors and guideline of treatment. Symptoms of diseases mentioned in Ayurveda can be said to be the nearest way to prove scientific nature of this unique health science. Symptoms of nearly all diseases are narrated in Ayurveda are similarly found mentioned in modern medicine. The difference only exists at two levels, first one is the way correlation of symptoms with pathology and second is the Sanskrita language.

The ancient Indian civilization was using Sanskrita as primary language and thus Ayurveda is written in Sanskrita. The language is one of main reason which superficially but clearly distinguishes Ayurveda from modern medicine. Here the term “Superficially” is significant as deep within both modern medicine and Ayurveda have equivalent understanding of patho-physiology. It will not be exaggeration to mention that Ayurveda has far better understanding of human patho-physiology than any other science on the earth. However considering the global norms for claiming scientific nature of any science, it is the need of hour to establish clinical database of Ayurveda concepts as well as interventions. Clinical study is the most important tool to achieve this requirement. Here again arises hurdle of modern criteria known as “Statistical analysis”. It is a hurdle because studies are not considered as scientific without statistical analysis, and as being numerical science statistics

expects special scorings for precise analysis. This is a major issue in evaluating sciences who are primarily depends on qualitative data and correlative experience based applied logics.

Therefore, in present paper an attempt has been made to present the need, advantages, methodology, limitation and further scope of standardization of scoring for clinical symptoms described in Ayurveda.

Material and methods:

Basic concepts of expectations of statistical tests which are applicable in Ayurveda clinical researches was studied along with study of the statistical data presented in published papers of indexed journals. Comparison of the various researches was done in order to find precision as well as missing information in statistical analysis. Based on the information and knowledge gained, only relevant explanatory and applied perspectives are presented here and describing studied published papers of Ayurveda clinical researches is skipped to avoid any complications arising thereof.

Observation and results:

Statistical tests such as Paired t test, unpaired t test, one way ANOVA are mostly utilized tests in experimental and clinical researches in Ayurveda. Wilcoxon signed rank test and Mann Whitney U test are also utilized but the frequency is comparatively less than aforementioned tests. The scoring pattern used for scoring/gradation of Ayurveda symptoms varies for same symptoms which indicate that the available standard scoring is not known to most researches. Information related to scoring such as whether normal distribution was assumed, whether collected numerical data had normal distribution or not, is also not found mentioned in most publications. In other words assumptions for choosing Parametric and Non-parametric tests which are mentioned in table 1 are needed to be described to highlight the

preciseness of the utilized statistical methodology. There are some correlation test tests such as Holm-

Sidak test, Pearson test and Spearman test which are found rarely utilized.

Table 1: Assumptions for choosing Parametric and Non-parametric tests

| Assumption | Parametric test | Non-parametric test |
|---|---|--|
| Population distribution | Normal Gaussian | Non-normal |
| Type of Scale | Ratio or Interval | Nominal or Ordinal |
| Variance | Homogenous | Homogenous as well as Heterogeneous |
| Measurement of central tendency | Mean | Median |
| Paired data in one condition | Paired t test | Wilcoxon Signed Rank test |
| Comparison of independent variable in two condition | Unpaired t test | Mann Whitney U test |
| Comparison of independent variable in more than two condition | One way ANOVA | Kruskal-Wallis Test |
| Repeated measure of independent variable in more than two condition | Repeated measure ANOVA | Friedman's test |
| Advantage | Powerful in hypothesis testing and for drawing more conclusions | Less powerful in hypothesis testing, Simple as not much affected by outliers |

Discussion:

For globalization of Ayurveda, findings established through experimental researches are to be analyzed and presented by keeping possible as maximum precision and transparency. However only laboratory investigational parameters have exact numerical values and thus they can be tested accurately. On the other hand effect on symptoms of a disease can only be statistically accessed through creating their scoring or gradation and then applying specific statistical test. The detail regarding scoring/gradation, its need, limitation and scope is described under following headings.

Understanding the scoring/gradation of symptoms:

In clinical studies, a researcher has to access the change based on selected parameters. There are two types of parameters in clinical researches viz. Subjective and objective parameters. Subjective parameters are subject

related i.e. patient feelings which includes various symptoms.^[1] Objective parameters are the unbiased parameters which can be tested in laboratory i.e. these parameters are devoid of patients feelings.^[2]

Subjective and objective parameters are qualitative and quantitative type of data respectively.^[3] For statistical analysis, the qualitative data i.e. symptoms of disease need to be converted into such a form that a researcher can show the intensity of symptom in numbers. Such numbering of symptoms with respect to severity is known as "Scoring of Symptoms". For example, *Abhyavaharan Shakti* (digestive power) can be divided into five categories, Taking food in good quantity twice / thrice (zero score), Taking food in normal quantity twice a day (1 score), Taking food in moderate quantity twice a day (2 score), Taking food in less quantity twice a day (3 score), Person taking food in less quantity once in a day (4 score)

and Person not at all taking food (5 Score). Thus scoring helps in converting immeasurable data into a measurable one and creates suitable format for applying statistical tests.

Need and advantages of scoring:

Madhava Nidana- an Ayurveda subject deals with pathology and manifestations of diseases. If a special scoring pattern is established for all symptoms narrated in the text then the value of Madhava Nidan will be scientifically accessible. Proper scoring will take researches towards genuine result of therapy as well as its significance value in comparison to standard drugs. In other words, scoring is necessary to establish effect of Ayurveda interventions as well as to find out which intervention is superior. Most of published researches in Ayurveda are claimed as non-scientific due to lack of unique disease wise protocol.^[4] It is also acceptable upto some extent because in many researches the scoring of symptoms varies for a particular disease. This is affecting process of meta-analysis which is an important data analytical method to combine and interpret results of many researches and draw a unique conclusion. In other words, uniform scoring of Ayurveda symptoms will increase uniformity in Ayurveda clinical researches as well as their meta-analysis.

Another advantage of uniform scoring is applicability of parametric statistical tests such as student t test. Parametric tests are powerful and non parametric test are weak tests.^[5] Thus for having a strong validity of research findings, parametric test is recommendable. Non-parametric tests analyze data by rank i.e. based on number individuals found in a rank of symptom and analyze how many individual showed reduction in rank. In simple words non-parametric tests can't compare how much a symptom decreased after intervention i.e. effect of therapy can not be analyzed based on non-parametric tests. However it can surely be done if scoring is

utilized which allows application of parametric tests. Thus it is clear that scoring of symptoms helps in applying strong statistical tests and thereby increases authority of final conclusions.

Methodology and limitation standardization of scoring for clinical symptoms described in Ayurveda:

Method of scoring of symptoms expects insight of researcher in distinguishing the various levels in which a symptom can manifest. In other words, thoughtful understanding of Madhava Nidana and experience based applied logic are the key factors for scoring of symptoms. As these key factors vary among researchers hence the created scoring will also be different. In other words, individually created scoring can help to statistically analyze a research work but it will fail to create a standard database.

It can be interpreted that, standardization of scoring is difficult task and it expect mutual understanding between various Ayurveda research organization as all organizations are expected to follow the created guideline. Considering the need, Ex-prof. M.S. Baghel has completed a WHO – DFC sponsored project on Developing Guidelines for Clinical Research Methodology in Ayurveda.^[6] In this special project, attempt has been made to standardize scoring of nearly all Ayurveda symptoms in categorical way with respect to involved physiological systems and diseases. Now, it is need of hour to utilize this guideline in clinical researches by all Ayurveda research institutions. This is the only method by which Ayurveda researches can bring uniformity in individual researches. However a major limitation of the guideline is unawareness and unavailability of the guideline in many Ayurveda institutes. It can be claimed that the guideline is not completely followed where it is available because there is no such clear recommendation or notification to Indian Ayurveda universities to use the guideline by AYUSH and CCRAS.

Further scope:

Standardization of Ayurveda clinical symptoms scoring i.e. creating uniform scoring pattern will play vital role to bring attention of scientific community towards genuinely and wide applicability of Ayurveda researches. It will also helps in globalization of Ayurveda not only in the form of evidence based medical science but also worldwide accessible database of evidences.

Conclusions:

Scoring is must criteria for scientific evaluation of Ayurveda clinical research with support of strong statistical analysis. MS Baghel's project entitled "Developing Guidelines for Clinical Research Methodology in Ayurveda" is the only available guideline for standardization of scoring for clinical symptoms described in Ayurveda but it should be strictly implemented in all Ayurveda research institutions. AYUSH and CCRAS should recommend this guideline for all Ayurveda clinical researches.

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Conflicts of interest

Nil.