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IMPACT OF AYURVEDIC MEDICINE: A DATA MINING APPROACH

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Abstract: Ayurveda follows its own unique philosophy and methodologies to address issues of health care. It prescribes variety of simple therapies as also certain complex treatments that could comprise of single ingredients, poly-ingredient formulations and combination of drugs, diet, lifestyle changes and therapies like massages, fomentation therapies, enemas and several other cleansing procedures as well. These treatments, oral medications or a combination of both are individualized in nature and ideally meant to be administered only after proper understanding of the ailment as per Ayurvedic diagnostics. Since last 4-5 decades major changes have occurred in Ayurvedic education, practice, research and manufacturing of Ayurvedic products. Ayurveda incorporates all forms of lifestyle in therapy. Thus yoga, aroma, meditation, gems, amulets, herbs, diet, astrology, color and surgery etc. are used in a comprehensive manner intreating patients. Treating important and sensitive spots on the body called Marmas isdescribed in Ayurveda. Massages, exercises and yoga are recommended.

Keywords: Ayurvedic medicine, cleansing procedures, diagnostics, research and manufacturing of Ayurvedic products

I. INTRODUCTION

The World Health Organization - WHO has estimated that major percentage of the population in developing countries depends primarily upon herbal medicine for basic health care.The traditional systems of medicine, commonly referred to as 'Complementary and Alternative Medicine' (CAM) are widely used and looked upon for possible and safe solutions to present day health and medical problems. Ayurveda, the Indian system of medicine practiced today has its roots in the Vedic thinking. Ayurveda follows its own unique philosophy and methodologies to address issues of health care. It prescribes variety of simple therapies as also certain complex treatments that could comprise of single ingredients, poly-ingredient formulations and combination of drugs, diet, lifestyle changes and therapies like massages, fomentation therapies, enemas and several other cleansing procedures as well. These treatments, oral medications or a combination of both are individualized in nature and ideally meant to be administered only after proper understanding of the ailment as per Ayurvedic diagnostics or *nidaan*. Since last 4-5 decades major changes have occurred in Ayurvedic education, practice, research and manufacturing of Ayurvedic products. Research in Ayurveda that began with search for new compounds from Ayurvedic plants and formulations based on pharmacological assertions and chemical moeities has come a long way with recent advances in biomedicine and technology. Research as part of learning and essential postgraduate training is expected to contribute towards overall growth of the sector. It is believed that drifting away from the fundamental principles and concepts had negative impact and therefore integration at the basic level of development of hypothesis of research is felt necessary. Much research is being carried out on single herbs, poly-herbal formulations or herbo-minerals.

Significance of The Study: Ayurveda has evolved over thousands of years as a system of medicine and is extensively used today as well. It includes various forms of treatment and therapy, including use of medicinal herbs, yoga, exercises, meditation, tantra etc, for the peace of body, mind and soul.

Objectives of the Study: The objective of the study is to investigate the impact of ayurvedic medicine.This is a case study of the magnitude and reasons to undergo ayurvedic treatment .The objectives of the study are the following

- To analyze the impact of the ayurvedic medicine
- To mention the common influencing factors that make people to trust ayurvedic medicine
- To provide the causes of those commonly occurred factors

Null Hypoytheses: A look at the disadvantages would show that the popularity of the system of medicine declined

because of the fear of adulteration and toxic substances mixed with the Ayurvedic formulae available in the market today. Also, reliability of the medicines and the physicians practicing it has been questioned. One must not forget that Ayurveda was used ages ago, and today the numbers and kinds of diseases and illnesses have increased multifold, and newer methods of medicine are being relied on for treatment and therapy.

II. RESEARCH METHODOLOGY

2.1 Methodology

The case study will consist of deferent stages, roughly following the cross industry standard procedure CRISP-DM. Firstly, the business understanding phase has to be carried out. In this phase, the project objectives and requirements are stated and reined and the resulting data mining problem is formulated. The results of this phase are summarized in the previous sections. Although the collection of additional data results in a richer data set and is therefore likely to give better results, model acting on a data set that is already automatically kept up-to-date is potentially a much more useful tool.

Design for Methodology: A multiple case study design with historical and cross-sectional perspectives was adopted. According to Patton (1987) a project is a case study design when it seeks to capture rich and unique experiences as they happen in reality. Merriam(1998) indicates that a historical case study is essentially descriptive and deals with developments in the past. Yin(1994) points out that a case study design is cross-sectional to the extent that it examines "how" and "why" questions in a contemporary set of events. To the extent that this study attempts to reflect upon historical and cross-sectional events as reconstructed by subjects or respondents it is a survey research, and since it aims to include investigations from more than a single case it is a multiple case study design. The implementation of the study has been framed around the following procedures:

- Developing a research proposal and instruments for data collection,
- Creating contact with respective educational bureaus,
- Selecting research settings and sampling the research population or respondents,
- Pre-testing instruments,
- Administering instruments and completing data collection,
- Analyzing and interpreting data, and writing a report.

2.2 Algorithm used

Cluster Analysis: Cluster analysis is a multivariate analysis that attempts to form groups or"clusters"of objects(Sample plots in our case)that are "similar" to each other but which differ among clusters. The exact definition of "similar" is variable among algorithms. But has a generic basis. The methods of forming clusters also vary, but follow a few general blueprints.

Similarity, Dissimilarity and Distance: Similarity is a characterization of the ratio of the number of attributes two objects share in common compared to the total list of attributes between them. Objects which have everything in common are identical, and have a similarity of 1.0. Objects which have nothing in common have a similarity of 0.0. As we have discussed previously, there is a large number of similarity indices proposed and employed, but the concepts are common to all.

Dissimilarity is the complement of similarity and is a characterization of the number of attributes two objects have uniquely compared to the total list of attributes between them. In general, dissimilarity can be calculated as 1-similarity.

K-means clustering: The most common partitioning method is the K-means cluster analysis. Conceptually, the K-means algorithm:

1. Selects K cancroids (K rows chosen at random)
2. Assigns each data point to its closest centroid
3. Recalculates the centroids as the average of all data points in a cluster (i.e.,the centroids are p-length mean vectors, where p is the number of variables)
4. Assigns data points to their closest centroids
5. Continues steps 3 and 4 until the observations are not reassigned or the maximum number of iterations(R uses 10 as a default) is reached.

Implementation details for this approach can vary: R uses an efficient algorithm by Hartigan and Wong(1979) that partitions the observations into k groups such that the sum of squares of the observations to their assigned cluster centers is a minimum. This means that in steps 2 and 4, each observation is assigned to the cluster with the smallest value of:

$$SS(K) = (X_{ij} - X_{kj})^2 \sum^{np}_{i=1,\, j=1}$$

Where k is the cluster,Xij is the value of the jth variable for the ith observation, andXkj nar is the mean of the jth variable for the kth cluster.

K-means clustering can handle larger datasets than hierarchical cluster approaches. Additionally, observations are not permanently committed to a cluster. They are moved when doing so improves the overall solution. However, the use of means implies that all variables must be continuous and the approach can be severely affected by outliers. They also perform poorly in the presence of non-convex(e.g., U-Shaped) clusters.

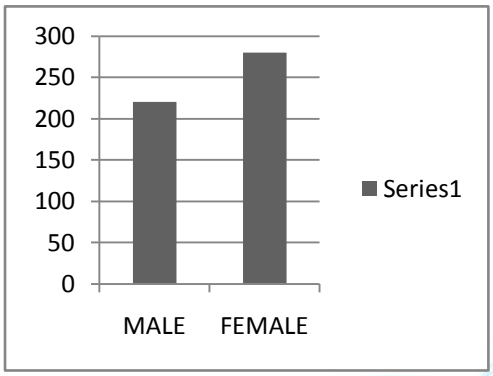
The format of the K-means function in R is k-means(x, clusters) where x is a numeric dataset(matrix or data frame0 and centers is the number of clusters to extract. The function returns the cluster memberships, centroids, sums of squares (within, between, total), and cluster sizes. Since K-means cluster analysis starts with k randomly chosen centroids, a different solution can be obtained each time the function is invoked. Use the set. seed () function to guarantee that the results are reproducible. Additionally, this clustering approach can be sensitive to the initial selection

of centroids. The kmeans() function has an start option that attempts multiple initial configurations and reports on the best one. For example, adding nstart=25 will generate 25 initial configurations. This approach is often recommended.

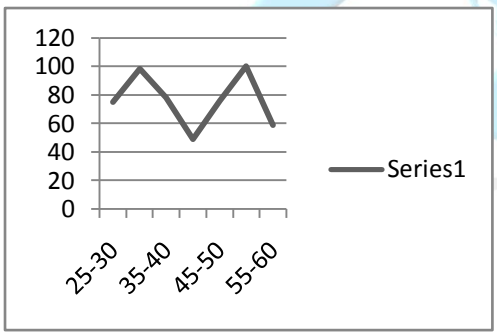
III. FINDING, INTERPRETATION, RECOMMENDATIONS AND SUGGESTIONS

3.1 FINDINGS AND INTERPRETATIONS

GENDER BASED



AGE BASED



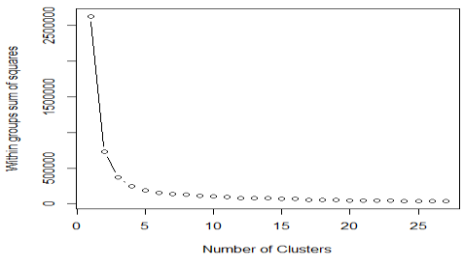
PARTITIONING FOR CLUSTERING

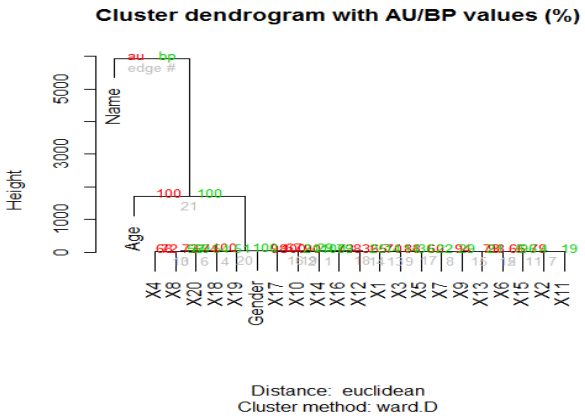
> for (i in 2:27) wss[i] <- sum(kmeans(sen,centers=i)$withinss)

> plot(1:27, wss, type="b", xlab="Number of Clusters", ylab="Within groups sum of squares")

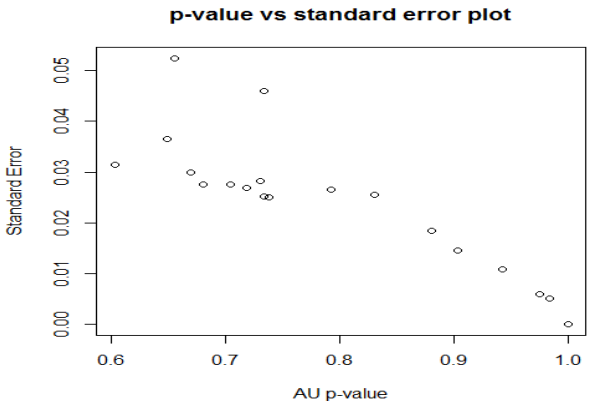
HIERARICAL AGGLOMATIVE

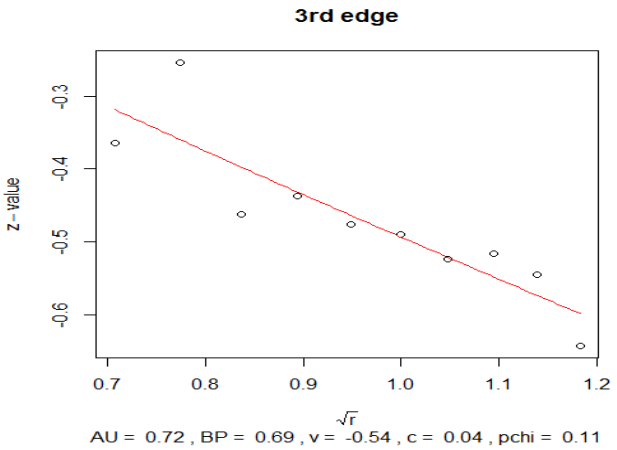
> plot(fit)

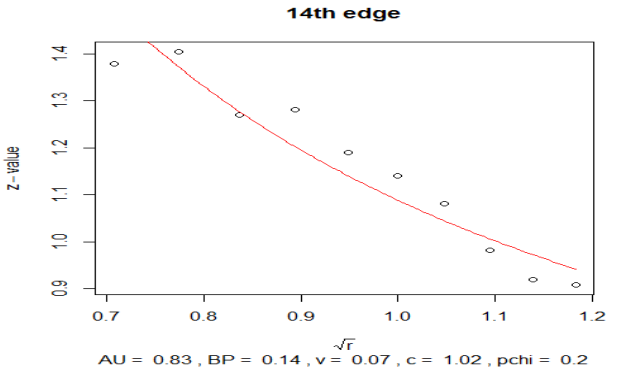




FINDING ERROR PLOT







MODEL BASED CLUSTERING

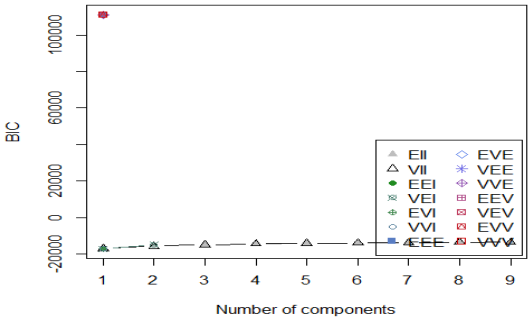
1.BIC

2.CLASSIFICATION

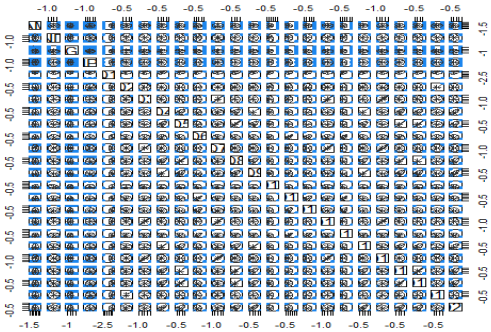
3.UNCERTAINTY

4.DENSITY

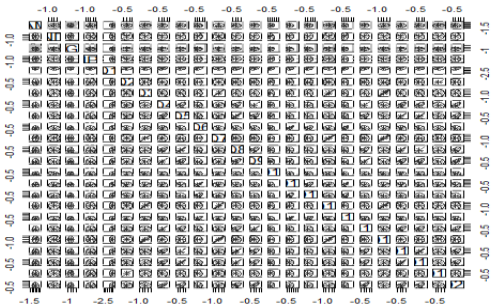
Selection: 1



Selection: 2



Selection: 3

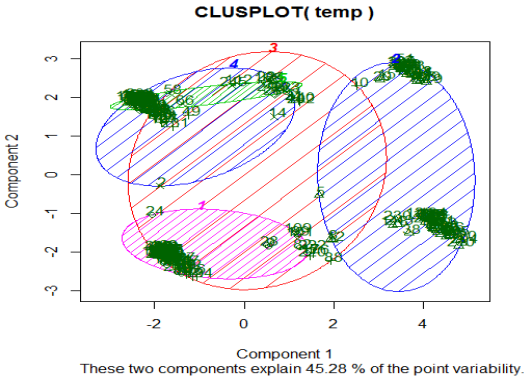


Plotting Cluster Solutions:

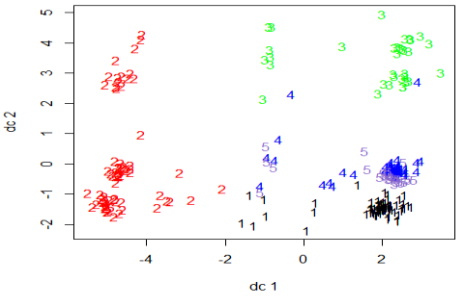
>fit <-kmeans(mydata, 5)

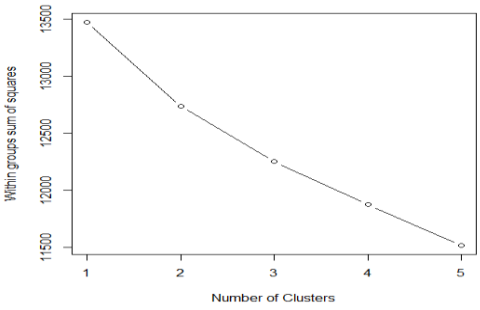
>library(cluster)

>clusplot(mydata, fit$cluster, color=TRUE, shade=TRUE, labels=2, lines=0)

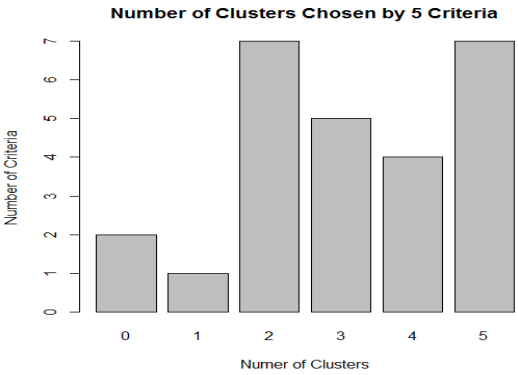


>library(fbc)





>**barplot**(**table**(nc$Best.n[1,]), xlab="Numer of Clusters", ylab="Number of Criteria", main="Number of Clusters Chosen by 5 Criteria")



3.3. SUGGESTION FOR FUTURE:

Ayurveda incorporates all forms of lifestyle in therapy. Thus yoga, aroma, meditation, gems,amulets, herbs, diet, astrology, color and surgery etc. are used in a comprehensive manner intreating patients. Treating

important and sensitive spots on the body called Marmas isdescribed in Ayurveda . Massages, exercises and yoga are recommended. The knowledge we have now is by three surviving texts of Charaka, Sushruta and Vaghbata.Charaka (1st century A.D.) wrote Charaka Samhita (samhita-meaning collection of verseswritten in Sanskrit). Sushruta (4th century A.D.) wrote his Samhita i.e Sushruta Samhita.Vaghbata (5th century A.D.) compiled the third set of major texts called Ashtanga Hridaya andwere revised and supplemented by Nagarjuna in the 6th century

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