ABSTRACT:

Memory plays a key role in the existence of an individual. The process of retaining and reproducing what has been learnt is known as remembering. The power of the mind to retain and reproduce is called memory. The efficiency of memory varies considerably between people and during the life time of an individual. According to Ayurvedic classics, recollecting the things which are seen, heard and experienced is called Smriti. Acharyas have graded efficiency of Smriti according to different Prakruti. Prakruti is the innate constitution of an individual based on his Dosha predominance determined at the time of conception which cannot be changed from birth till death. Therefore an effort is done to assess the status of Smriti in different Prakruti.

A survey was conducted on the students from SDM College of Ayurveda Hassan. 100 students pertaining to each Vata, Pitta and Kapha Pradhana Prakruti were selected randomly based on the standard questionnaire prepared and thereafter memory rating is done according to the PGI Memory Scale. Statistical analysis was done using Spss software 16 and One way anova was done as there are three groups and the sample size is 300, to find significance in mean score obtained by each student. Therafter post hoc test (Tukey) was applied for the sub test which was significant for multiple comparison between the groups. The study establishes the relation of Smriti with Prakruti. Pitta pradhana Prakruti scored more in majority of the sub test compared to Vata and Kapha pradhana Prakruti.

Keywords: Smriti, Prakruti, PGI Memory Scale, memory

INTRODUCTION: Prakruti is a non-pathological Doshik status, which is inherent in the individual from birth to death\(^1\). Ayurveda has an individualistic approach to consider each human separately; that is Prakruti is unique. Variations can be seen with respect to height, weight, built, skin, eyes etc. In the same way health-ill health, intelligence, food and other activities depends on the individual constitution. The analysis of the mind and intellect from different angles and their explanations are abundantly available in Ayurvedic classics which provide evidence of quantum of thoughts, crystal clear vision as well as experience of the ancient scholars. Now it is the need of the era to interpret and conclude those ancient concepts of Buddhi and Smriti in terms of modern medical and psychological terms. Acharyas have graded Smriti with respect to different Prakruti like, as per Charaka in Vata Prakruti they are Alpa Smriti and Sruta Grahi\(^2\) and as per Vagbhata they have Chala Smriti\(^3\). As per Susrutha\(^4\) and Vagbhata\(^5\) in Pitta Prakruti individuals are Medhavi. In Kapha Prakruti individuals, as per Acharya Susrutha\(^6\) they are Chiragrahi and according to Vagbhata they are Smrutiman\(^7\).

MATERIALS AND METHODS:

The study was carried out with the main objectives
• To assess the status of *Smriti* in different *Prakruti*.
• To study in depth on *Smriti*.

**Study design:** Descriptive cross sectional study.

**Sample size:** 300

**Sample frame:**
Students from SDMCA Hassan.

**Sampling Technique:**
Convenient sampling technique.

**RESULTS:**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Sum of squares between the groups</th>
<th>Sum of squares within the groups</th>
<th>Mean square between the groups</th>
<th>Mean square within the groups</th>
<th>F value</th>
<th>Significance</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote memory</td>
<td>2.220</td>
<td>75.950</td>
<td>1.110</td>
<td>0.256</td>
<td>4.341</td>
<td>0.014</td>
<td>Significant</td>
</tr>
<tr>
<td>Recent memory</td>
<td>1.167</td>
<td>52.020</td>
<td>0.583</td>
<td>0.175</td>
<td>3.330</td>
<td>0.037</td>
<td>Significant</td>
</tr>
<tr>
<td>Mental balance</td>
<td>1.147</td>
<td>111.450</td>
<td>0.573</td>
<td>0.375</td>
<td>1.528</td>
<td>0.219</td>
<td>Not significant</td>
</tr>
<tr>
<td>Attention and concentration</td>
<td>55.547</td>
<td>1988.44</td>
<td>27.773</td>
<td>6.695</td>
<td>4.148</td>
<td>0.017</td>
<td>Significant</td>
</tr>
<tr>
<td>Delayed recall</td>
<td>1.820</td>
<td>223.710</td>
<td>0.910</td>
<td>0.753</td>
<td>1.208</td>
<td>0.300</td>
<td>Not significant</td>
</tr>
<tr>
<td>Immediate recall</td>
<td>8.887</td>
<td>364.03</td>
<td>4.443</td>
<td>1.226</td>
<td>3.625</td>
<td>0.028</td>
<td>Significant</td>
</tr>
<tr>
<td>Verbal retention of similar pairs</td>
<td>0.320</td>
<td>28.600</td>
<td>0.160</td>
<td>0.096</td>
<td>1.662</td>
<td>0.192</td>
<td>Not significant</td>
</tr>
<tr>
<td>Verbal retention of dissimilar pairs</td>
<td>25.220</td>
<td>827.35</td>
<td>12.610</td>
<td>2.786</td>
<td>4.527</td>
<td>0.012</td>
<td>Significant</td>
</tr>
<tr>
<td>Visual retention</td>
<td>48.887</td>
<td>2010.5</td>
<td>24.443</td>
<td>6.769</td>
<td>3.611</td>
<td>0.028</td>
<td>Significant</td>
</tr>
<tr>
<td>Recognition</td>
<td>3.207</td>
<td>61.390</td>
<td>1.603</td>
<td>0.207</td>
<td>7.757</td>
<td>0.001</td>
<td>Significant</td>
</tr>
</tbody>
</table>

From the above results, recent memory is significant at p value 0.014, Remote memory at the p value 0.037, attention and concentration at 0.017, immediate recall at 0.028, verbal retention of similar pairs at 0.192, verbal retention of dissimilar pairs at 0.012, visual retention at 0.028, and recognition at 0.001.
0.028, verbal retention of dissimilar pairs at 0.012, visual retention at 0.028 and recognition at 0.001 at the level 0.05

Having found statistically significant evidence that the mean scores of sub tests—remote memory, recent memory, attention and concentration, immediate recall, verbal retention of similar pairs, visual retention

and recognition were not same for different Prakruti, the next step is to explore in which group the maximum score is obtained.

So to find out the pair wise comparison between the groups post hoc test (Tukey multiple comparison test was applied.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VPP</td>
</tr>
<tr>
<td>Remote memory</td>
<td>5.58</td>
</tr>
<tr>
<td>Recent memory</td>
<td>4.71</td>
</tr>
<tr>
<td>Mental balance</td>
<td>7.91</td>
</tr>
<tr>
<td>Attention and concentration</td>
<td>13.24</td>
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<tr>
<td>Delayed recall</td>
<td>9.66</td>
</tr>
<tr>
<td>Immediate recall</td>
<td>10.94</td>
</tr>
<tr>
<td>Verbal retention of similar pairs</td>
<td>4.90</td>
</tr>
<tr>
<td>Verbal retention of dissimilar pairs</td>
<td>13.21</td>
</tr>
<tr>
<td>Visual retention</td>
<td>9.96</td>
</tr>
<tr>
<td>Recognition</td>
<td>9.66</td>
</tr>
</tbody>
</table>

DISCUSSIONS: Selection of Age & Educational Status

The inclusion criteria for the study was selected between the age group of 20 -22yrs for the results to be more precise.

The significance in studying a small age group has been evidently studied and the results are shown below.143

From the above results, it is evident that there is significant variation in memory in different age groups. So for the present study the age group 20-22 was selected.

The result also signifies that education wise changes have an impact on variation in memory. For the present study students from the same educational status were included for more precise result

Reliability of the test144 – Post Graduate Institute Memory test – As per the study conducted on the reliability and validity of a new battery of memory tests (PGI Memory Scale), the result highlights that this scale is satisfactorily reliable and valid.
tool to measure memory in the population. The definition accepted for this test was that memory is an ability to retain and reproduce impressions once perceived with an intention to use it in future. The result of the study also highlights that mean scores obtained in elderly volunteers were significantly low as compared to normal.

**Relation between the Drusta, Shruta and Anubhootha type of memory with different domains according to the PGI Memory Scale.**

*Drusta, Shruta* and *Anubhootha* are the means by which one perceives and help in memorizing what has been perceived. PGI Memory Scale is a comprehensive tool to assess memory consisting 10 sub tests. The 10 domains can be classified under the three headings as explained by the Acharya Charaka as *Drusta, Shruta* and *Anubhootha*.

*Drusta* is the knowledge by means of direct perception. As *Cakrapani*\(^{145}\) comments *Drusta* is attained through *Pratyaksha*. *Pratyaksha* means in front of eyes that is which is seen. But the word *Pratyaksha* is not only limited to *Chakshurendriya* but also *Pancha Indriya Pratyaksha*. But in the present context, *Drusta* is limited only to *Chakshurendriya*. So among the sub tests, visual retention and recognition can be included.

*Shrutha* is that which is heard. This may be in the form of scriptures. Here it is limited to auditory senses. So the sub tests Delayed recall, Immediate recall, Verbal Retention of Similar Pairs, Verbal Retention of Dissimilar Pairs, Attention and concentration can be included.

*Anubhootha* is through previous experiences. So the sub test remote memory, recent memory and mental balance can be included.

From the results obtained, it can be seen that among the 10 sub tests remote memory, recent memory, attention and concentration, immediate recall, verbal retention of dissimilar pairs, visual retention and recognition are found to be significant with respect to *Prakruti*. To conclude Recognition and visual retention can be considered under *Drusta*. Immediate recall, Attention and concentration, verbal retention of dissimilar pairs can be considered under *Shruta*. Remote memory and recent memory can be considered under *Anubhootha*.

Relation between prakruti gunas and smriti Acharya Charaka has explained *Prakruti Lakshanas* with *Gunas of Prakruti* and its specific manifestation in the body with respect to the attributes. With respect to *Smriti* and *Prakruti Gunas* it can be summarized as-

*Vata prakruti* individuals are endowed with features like *Alpa Smriti, Chala Smriti* and *Shruta Grahi*. Based on the results regarding *Prakruti* and *Chala Guna*, it can be inferred that maximum of *Vata Pradhana* individuals have scored higher. In relation to the memory tests, the sub test Immediate Recall which is significant between the *Prakruti*, the number of subjects who scored the maximum marks are less compared to other groups. So in *Vata Prakruti* individuals, because of *Sheegra Guna* the subjects may grasp easily but because of *Chala Guna* the subjects tends to forget it quickly. Therefore *Vata Pradhana Prakruti* individuals are considered as *Shruta Grahi* and *Alpa Smritaya*.

*Pitta Prakruti* individuals are endowed with the features like *Medhavi, Nipunamati* and *Panditha*. Based on the results regarding *Prakruti* and *Teeksha*...
Guna, it can be inferred that maximum of Pitta Pradhana individuals have scored higher. In relation to the memory, the sub test Visual retention which is significant between the Prakruti, the number of subjects who scored the maximum marks are much higher compared to other groups. So in Pitta Prakruti individuals, because of Teekshna Guna the subjects grasp and retain it for a longer time. Therefore Pitta Pradhana Prakruti individuals can be considered as Medhavi, Nipunamati and Panditha.

Kapha Prakruti individuals are endowed with the features like Smrutiman and Chira Grahi. Based on the results regarding Prakruti and Sthira Guna, it can be inferred that maximum of Kapha Pradhana individuals have scored higher. In relation to the memory tests, the sub test Remote memory which is significant between the Prakruti, the number of subjects who scored the maximum marks are much higher compared to other groups. So in Kapha Pradhana individuals, because of Sthira Guna the subjects retain the knowledge gained for a longer time. Therefore Kapha Prakruti individuals can be considered as Smrutiman.

The predominance of Doshas in different Vaya has been explained as - in the Balya Avastha Kapha is predominant, in Madhyama Avastha Pitta is predominant and in Vruddha Avastha, Vata is predominant. While considering the variations in the predominance of Dosha, as Kapha is predominant in Balya Avastha, whatever learned or experienced will be retained for longer time. In Madhyama Vaya, due to the predominance of Pitta, the capacity of retaining and reproducing what has been learnt will be sharp. As Vata is predominant in the Vrudhaavastha, there is decreased response of retaining and reproducing. This can be substantiated with the results in the study. In the subtest remote memory, those with Kapha Prakruti has the highest score compared to other Prakruti. The reason may be in Kapha Prakruti individuals, as there is a predominance of Kapha in Balya Avastha whatever learned or experienced is retained for a longer time. So in the sub test remote memory Kapha Prakruti individuals showed higher response. Whereas in majority of other sub tests the maximum score obtained is by Pitta Prakruti individuals as they are in the Madhyama Vaya and has an excellent power of retaining and memorizing due to the predominance of Pitta in the Madhyama Vaya.

**DISCUSSION OF RESULTS ON SIGNIFICANCE:** Among the 10 sub test, remote memory, recent memory, attention and concentration, immediate recall, verbal retention of dissimilar pairs, visual retention and recognition are statistically significant. Remote and recent memory subtests have to be relied on the subject’s response.

Remote memory is about reproducing the facts that has happened long back. Among the three Pradhana Prakruti, Kapha Pradhana Prakruti has maximum individuals who scored the maximum marks compared to other two. The mean score for Kapha Pradhana individuals in remote memory is 5.79 compared to 5.70 in Pitta Pradhana and 5.58 in Vata Pradhana. Significance is seen only between Kapha Pradhana Prakruti and Vata Pradhaana Prakruti which signifies that Pitta Pradhana and Vata Pradhana Prakruti are in the same line. The reason for this may be due to the Sthira Guna of Kapha that enable one to retain the experiences for long time compared to
Vata Prakruti where the score obtained is less due to the Sheegra Guna that enable the individual to forget easily about the experiences.

Recent memory is the subtest on the immediate past. Among the three Prakruti, Pitta Pradhana Prakruti has maximum individuals who scored the maximum marks compared to other two. The mean score for Pitta Pradhana individuals in recent memory is 4.86 compared to 4.81 in Kapha Pradhana and 4.71 in Vata Pradhana Prakruti. Significance is observed only between Vata and Pitta Prakruti that signifies Kapha Prakruti and Vata Prakruti are in the same line. The Teekshna Guna of Pitta along with Sthira may be responsible for retaining the experience and the Chala Guna of Vata makes the individual to forget the incidents at a faster rate.

Attention and concentration is the subtest on digit counting that requires both attention and concentration to reproduce the digits. Among the three Prakruti, Pitta Pradhana Prakruti has maximum individuals who scored the maximum marks compared to other two. The mean score for Pitta Pradhana individuals in recent memory is 14.26 compared to 13.52 in Kapha Pradhana and 13.24 in Vata Pradhana Prakruti. Significance is observed only between Vata and Pitta Prakruti followed by Kapha Pradhana Prakruti with significant difference among them. The significant difference in Pitta Pradhana Prakruti may be due to Alochaka Pitta with the Sthana in Druk that plays a major role in vision and the Buddhivaisheshika Pitta in the Sringataka helps in retaining and remembering with the experience through vision. The mean score obtained for Vata Pradhana individuals are comparatively less that may be due to the Chanchala Guna of Vata that hinders the proper retention. The mean score for Kapha Pradhana individuals are in between the both but more towards the score obtained by Pitta Pradhana individuals. This may be due to the Manda Guna of Kapha that takes more time for them to retain but the objects retained are reproduced quickly.

In the subtest Verbal retention of dissimilar pairs, significance is observed between Vata and Pitta Pradhana Prakruti and between Pitta and Kapha Pradhana Prakruti. Between Vata and Pitta, Pitta Pradhana has a higher score and between Pitta and Kapha Prakruti, Pitta Pradhana has a higher score. So among the three Pitta Pradhana Prakruti is significant. The mean difference between Vata and Kapha Pradhana Prakruti is very less which signifies both are almost the same.

In the subtest visual retention and recognition, perception is attained through eyes and retained and then reproduced. The mean score for Pitta Pradhana Prakruti in visual retention is 10.87 as compared to 10.08 in Kapha pradhana Prakruti and 9.96 in Vata Pradhana Prakruti. The mean score for Pitta pradhana Prakruti in recognition is 9.91 as compared to 9.82 in Kapha Pradhana Prakruti and 9.66 in Vata Pradhana Prakruti.
The subtest immediate recall is found to be significant but considering the mean score for Pitta Pradhana and Kapha Pradhana Prakruti which are 11.91 and 11.90 respectively with only marginal difference between them. But in Vata Pradhana Prakruti the mean score obtained is 10.94 which is comparatively low. This may be due to Chala Guna of Vata that is responsible for Shrutagrahi and Alpa Smrutaya.

The sub test mental balance, delayed recall and verbal retention of similar pairs are not significant. The reason for this may be for the subtest mental balance which consists of questions that have been learned in the primary classes such as repetition of alphabets and numbers which are easily answerable by most of the subjects. Similarly the sub test delayed recall consists of reproducing the objects name asked in order and verbal retention of similar pairs consists of easily understandable items.

Variations in the scores obtained by the subjects Ayurvedic approach towards this difference in scoring can be related to process of Manas. Information is grasped according to the impression made on Manas. When a student starts learning some topic, Indriyabuddhi is produced on account of the combination of Indriya and Artha which is transient in nature. Some students grasp the subject during this phase and also retain it. They are the fast learners. But majority of the students come under the second type. They cannot get the knowledge but by frequent repetition as it makes an impression on Manas and thus cognition takes place. They are normal learners. The third type of student is not able to make an impression on Manas even after frequent repetition. They have difficulty in remembering the subject and they become slow learners. This may be due to the Chanchala Guna of Manas. Naturally, by virtue of these qualities Manas cannot be concentrated on any subject but can be controlled by constant Abhyāsa which is method that aids good memory.

Various other factors that can distract the Manas during the assessment are any external stimuli in form of sound, tension, fear and anxious about the questions that are to be asked.

CONCLUSION: The study establishes the relation of Smriti with Prakruti. Among the 10 subtests, domains relating to remote memory, recent memory, attention and concentration, immediate recall, Verbal retention of dissimilar pairs, visual retention and recognition have shown significance with respect to prakruti. Kapha Pradhana Prakruti has obtained high score in remote memory. Pitta Pradhana Prakruti has obtained high score in multiple domains like recent memory, attention and concentration, immediate recall, verbal retention of similar pairs, visual retention and recognition. This rationality between Smriti and Prakruti can be better understood by relating with the specific Guna of the Prakruti. The Sheegra and Chala Guna of Vata is responsible for the quick grasping and short memory in Vata Pradhana Prakruti. The Teekshna Guna of Pitta is responsible for sharp intellect in Pitta Pradhana individuals. The Sthira Guna of Kapha is responsible for good memory in Kapha Pradhana individuals.

REFERENCES:

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