

Use of Mnemonics to enhance learning in the B.A.M.S Students

Research article

Kalpana K Tawalare^{1*}, Kiran A Tawalare²

1. Assistant Professor, Dept. of Rachana Sharir, 2. Assistant Professor, Dept. of Kriya Sharir, Shri Ayurved College, Hanuman Nagar, Nagpur 09.

Abstract

Ancient human lacking the skills and devices required to store large amount of information. Necessity leads them to invent and develop a system of mnemonics. Broadly speaking mnemonic is a group of memory techniques, or mental 'slights of hand' that together facilitate the quick and easy assimilation of information likes facts, figures, names, faces and events. Ayurveda is one of the field endowed Sanskrit terminologies with verses from Ayurvedic compendia. Sometime this may leads to crash the student's confidence and big question arises for them how to learn all these things within speculated time period. Present study was planned to make the hard study task easy with the help of mnemonics and to improve recalling capacity of the student. For this study 60 students of first B.A.M.S. enrolled randomly. Lectures arranged consecutively with traditional method and with the help of mnemonics for 10 days each. After teaching, evaluation of feedback form and MCQ test was done. Data obtained was analyzed statically with help of paired - t test and Kruskal-Wallis test. It is concluded that mnemonics were useful to enhance the learning with significance level $p < 0.0001$.

Key Words: Mnemonics, Ayurveda, Traditional method, *Marma*

Introduction:

Ancient human lacking the skills and devices required to store large amount of information. Necessity leads them to invent and develop a system of mnemonics. This ancient art of memory was discovered in 447 BC by Greek Poet Simonides and described by Cicero, Quintilian and Pliny.(1) A mnemonic (the first "m" is silent) is a learning technique that aids to retain information. This

word is derived from the ancient Greek word mnemonikos (of memory, or relating to memory) and is related to Mnemosyne (remembrance) that means Greek Goddess of memory. Broadly speaking mnemonic is a group of memory techniques, or mental 'slights of hand' that together facilitate the quick and easy assimilation of information likes facts, figures, names, faces and events. All can be learned and recalled far easier by using mnemonics, than by using the traditional means of learning. Till now most of education system runs with traditional means of learning. They are in need to update with upcoming new technologies of teaching learning method.

Mnemonic instructions are the way to help students to remember information and vocabulary more effectively and easily. It involves linking unfamiliar

*Corresponding Author:

Kalpana K. Tawalare,

Assistant Professor,

Dept. of Rachana Sharir,

Shri Ayurved College,

Hanuman Nagar, Nagpur 09.

E-mail: drkalpanatawalare@gmail.com

Ph. N: +91-9730012127

information to be learned with already known familiar information through the use of a visual picture or word combinations. Mnemonics strategies are systematic procedures for enhancing the memory and making information more meaningful. Their particular use is in developing better ways to encode information so that it will be much easier to retrieve and remember the information. Fundamental aspect in developing mnemonic strategies is to find a way to relate new information with information that is already in memory of student.(2)

Thus use of mnemonics can apply to learn any type of material from any field. Ayurveda is one of the field endowed Sanskrit terminologies with verses from Ayurvedic compendia. Sometime this may leads to crash the student's confidence and big question arises for them how to learn all these things within speculated time period. In this stressful condition use of mnemonics may become effective educational tool. So through this study project author enlighten the concept of use of mnemonics in the field of Ayurveda.

Context of the Study:

Aims:

1. To enhance the learning process with the help of mnemonics.
2. To improve recalling capacity of the student.

Objectives:

1. To provide pleasant and stress free atmosphere during learning.
2. To make hard study easier with the help of mnemonics.

Goal:

1. To established the practical utility of mnemonics in the field of Ayurveda.

Rationale:

As medical information continues to grow at an exponential rate, it becomes increasingly difficult for medical students,

residents and even practicing physicians to feel comfortable with their knowledge and recall capacity. Similarly students of Ayurveda are facing difficulties in remembering new, difficult or uninteresting material, because of all basic texts are available in Sanskrit language. It is quiet difficult to newly come students to learn more information and more complex content in short period. In this condition mnemonics may becomes useful educational tool to make hard study task easy, by providing stress free environment with fun to study.(3)

Materials and Methods:

Materials:

This experimental study was conducted on 60 students of first BAMS Shri Ayurved College, Nagpur. Permission from the head of the Institute and HOD was obtained. Permission from Institutional ethical committee was obtained to carry out research project in the college. Idea of research project and the assessment method was given to all the students and consent was taken from. Project plan was discussed with HOD and other departmental staff. Their valuable inputs were taken into consideration. Questionnaire to take feedback and MCQs were prepared earlier and verification done from expertise. Whole study was completed in 6 months.

Methods:

Ten subsequent lectures were conducted to teach topic *Koshtha sharir* with traditional method. Then pre MCQ test was carried out. Similarly next ten subsequent lectures were conducted to teach the topic *Marma* with the help of self prepared mnemonics. Following mnemonics methods were used to teach the students. First of all 3R's concept explained to students. All types of *Marma* were taught them with the help of major system, keyword method and story method using vivid diagram.

Keyword method:

This is a technique commonly used to learn vocabulary words. It takes unfamiliar information and makes it more meaningful and concrete, thus easier to remember. During the application of keyword method follows 3R's

- a) Reconstructing - Coming up with a keyword. Something that is familiar to the student, easily pictured, and acoustically similar.
- b) Relating - Link the keyword with the definition of the new word in a picture.
- c) Retrieve - Teaching the process of how to remember the new vocabulary word and meaning.

Example: teaching the word piggin and its meaning, bucket. The word piggin means bucket. Develop keyword-Pig - it is familiar to students, acoustically similar to piggin and can be easily pictured. Develop a picture of a pig sitting in a bucket linking the keyword and the definition of the word.

Teach the process: "When I say piggin, first think of the keyword pig, then what was happening with the pig, the pig was sitting in a bucket, then the answer-bucket." It is very important to not forget to teach the students the process of how to remember and recall the needed information.(4)

Major system: This mnemonic technique used to aid in memorizing numbers which is also called the phonetic number system. It works by converting numbers first into consonant sounds, then into words by adding vowels. The words can then be remembered more easily than the numbers.

Story Method: In this method, prepare interesting story and flow the story with vivid images.

Things to use mnemonics more effectively:

- Use positive, pleasant vivid and colourful images
- Exaggerate the size of important parts of the image.
- Uses of humour, funny or peculiar things are easier to remember than normal ones.
- Rude or sexual rhymes are very difficult to forget.
- Use all the senses sounds, smells, tastes, touch, movements and feelings to code information.
- Bring three dimensions and movement to an image.

Intervention:

The group under study was consists of 60 students of Ist B.A.M.S. First 10 days all 60 students taught the topic *Koshtha* (GI tract) with traditional method without using mnemonics. Then pre MCQ test was carried out. Next with the same 60 students, series of 10 lectures were arranged to teach the *Marma*, with the help of mnemonics. Then post MCQ test was carried out. 15 MCQ decided for each pre and post test. Thus single group of 60 students undergoes pre test and post test in the form of MCQs. Feedback was taken after post test for qualitative data.

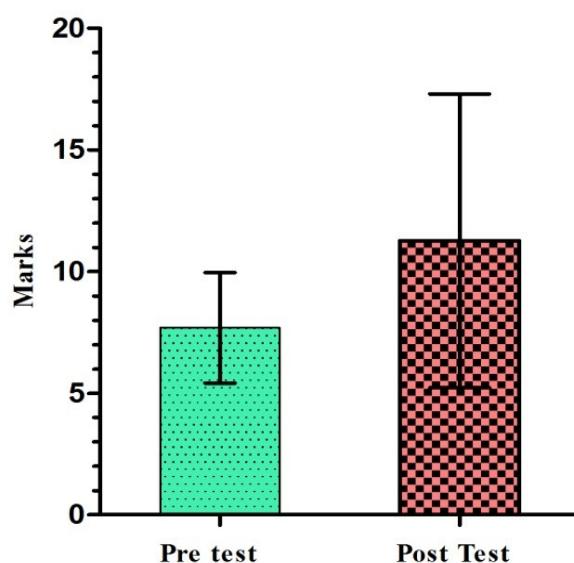
Preparation of feedback questionnaire:

Questionnaire containing questions about enhancing learning process and improve recalling capacity with the help of mnemonics was prepared. Visual analogue scale was used for questionnaire formation. Questionnaire was comprised items asking students to rate their level of agreement on five point Likert scale. The primary outcomes were evaluated using a five point scale ranging from strongly agree (SA=5), agree (A=4), undecided (UD=3), disagree (DA=2), strongly disagree (SDA=1). In addition to the questionnaire four open ended questions was asked about the benefits and drawbacks of NSP as an educational tool.

Observation and Result:

Table 1: Showing pre and post test score of the students.

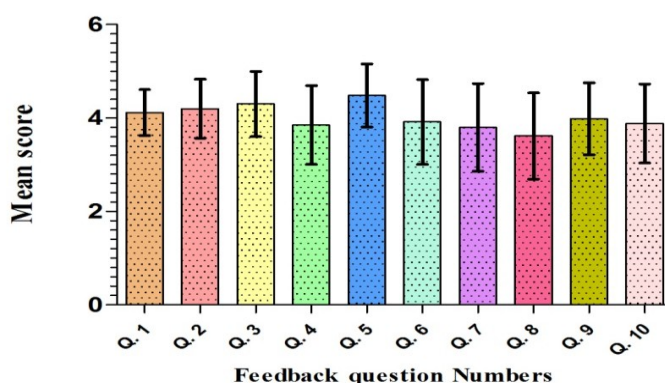
Paired t test	Pre test	Post test	$t = 4.388$ $df = 59$ $p < 0.0001$ which is highly significance.
Number of students	60	60	
Mean	7.683	11.27	
Std. Deviation	2.274	6.039	
Std. Error	0.2935	0.7796	



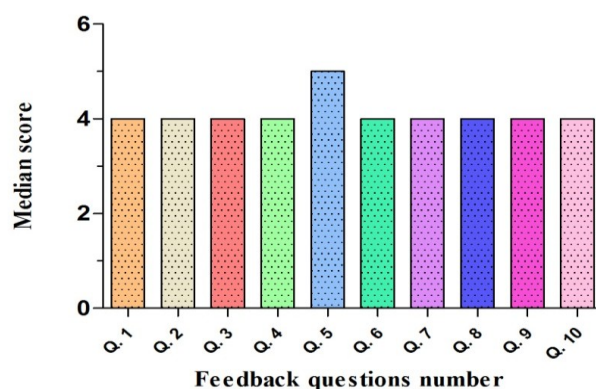
Graph 1: Comparison of students score before and after mnemonics

Table 2: Feedback analysis on the basis of 5 point Likert scale.

Question no.	Q.1	Q. 2	Q. 3	Q. 4	Q. 5	Q. 6	Q. 7	Q. 8	Q. 9	Q.10	Kruskal-Wallis test statistic 56.07 $P < 0.001$
Number of values	60	60	60	60	60	60	60	60	60	60	
Median	4	4	4	4	5	4	4	4	4	4	
Mean	4.12	4.20	4.30	3.85	4.48	3.92	3.80	3.62	3.98	3.88	
Standard Deviation	0.49	0.63	0.70	0.84	0.68	0.91	0.94	0.92	0.77	0.85	
Standard Error	0.06	0.08	0.09	0.11	0.09	0.12	0.12	0.12	0.10	0.11	



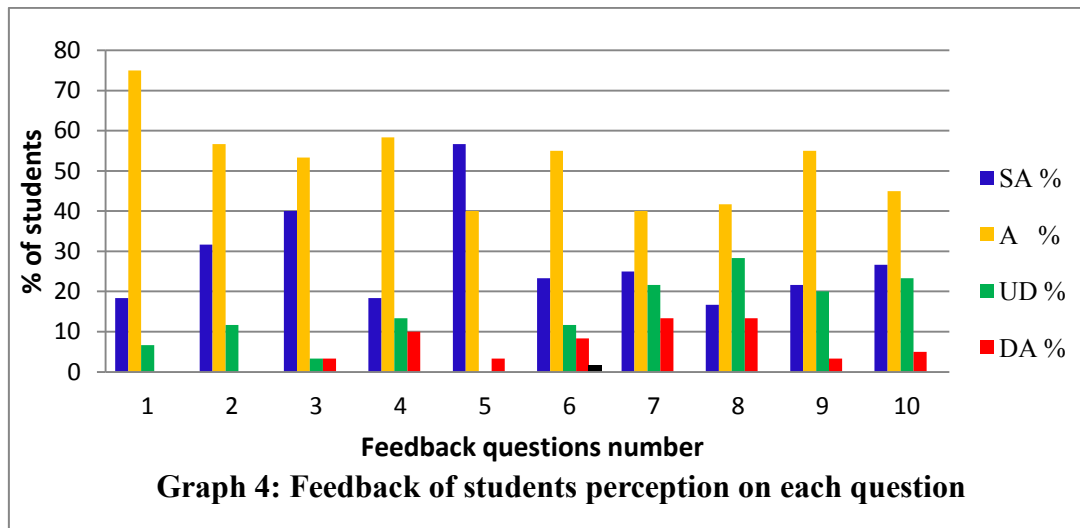
Graph 2: Showing relationship between question and mean score



Graph 3: Showing relationship between question and median score

Table 3: Analysis of percentage of student's feedback (SA=5, A=4, UD=3, DA=2 & SDA=1)

Feedback analysis (n=60)						
No	Questions	SA %	A %	UD%	DA %	SDA %
1	The clear idea about project and mnemonics is given to me.	18	75	7	0	0
2	Mnemonics help to enhance the learning process.	32	57	12	0	0
3	Mnemonics are good techniques for recalling topic.	40	53	3	3	0
4	Mnemonics are helpful to remember the subject's knowledge.	18	58	13	10	0
5	Mnemonics create interest during study with fun.	57	40	0	3	0
6	Mnemonics help to reduce mental tension or pressure while remembering.	23	55	12	8	2
7	Time requirement is reduced to study the topic with the help of mnemonics.	25	40	22	13	0
8	Sanskrit terms & numerical can be remembered easily with the help of mnemonics.	17	42	28	13	0
9	Time given to complete the feedback is adequate.	22	55	20	3	0
10	It is possible to use mnemonics by your won.	27	45	23	5	0



The result shows that students, who used mnemonics, enhance the learning process possibly with more fun and improved recalling capacity in academics. MCQ score is significantly increased when post test score was compared against the pre test score with paired student - t test. The students’ recall capacity improved significantly shown from the P value ($P < 0.0001$). [Table 1 and graph 1] Obtained feedbacks results, on the basis of 5 points Likert scale with the help of Kruskal Wallis test ($P < 0.0001$) suggests that in addition to the cognitive effectiveness of mnemonics in increase recalling, mnemonics might also creates learning easier, more interesting and enhance the learning process. [Table 2 and Graph 2, 3] Analysis of percentage of students’ feedback was calculated. [Table 3 and Graph 4] Qualitative analysis of student responses showing main domains of experience after use of mnemonics. [Table 4]

Table 4: Result of qualitative analysis of student responses showing main domains of experience after Mnemonics

Main Domains	Sub-Domains and the responses
General feeling about Mnemonics	Reduce worries about study. I am quite impressed by the technique. I can easily remember more things at a time with sequence also. It is the best solution for topic which needed short term memory. Mnemonics are techniques for remembering information which is otherwise quite difficult to recall. Mnemonics as a means to support study skills.
Influence on learning process	Enhance learning process with the help of mnemonics. Help in paying more attention to subject. Memorization was better. “Anyone can create their own mnemonics to aid the memorization of novel material.” Mnemonics 'tricks' are so useful that they remove the need for constant repetition.
Need more practice	Practice of using mnemonics gets more perfect. May be beneficial if we do self. I am not completely aware about mnemonics. It is time consuming process. Everyone cannot learn best using them.

Advantages in perspective of Students.	We can study more in less time. Remember set of information. Also helps to the students having poor memory. I think, it is very useful at the time of examination. It is the way to make hard study easy. It may be a very effective way of structuring information for revision is to draw up a full, colour coded of the subject. Remember for long time. Less time required for revision. Learning hard verves can possible by these methods easily. It is good for numerical. Doing study with fun.
Disadvantages of mnemonics	Sometime it creates confusion while recalling. More use of this method can confuse. “Students makes lazy and they can face more problems in future while remembering other topics without mnemonics.” Mnemonics could not help in understanding subject but it helps in retained the subject.
Suggestion	You can use other methods of mnemonics also. Teachers should be provided readymade mnemonics on ‘must to know’ area topics. The saying ‘two heads are better than one’ is truly applied for learning process with mnemonics. More individuals involved in the process will help with developing more ideas.

Discussion:

The study project is conducted at Shri Ayurved College, Nagpur, one of the medical institutions affiliated to Maharashtra University of Health Sciences Nashik. On the basis of result we recommend that other departments of all different courses of health sciences should practice the mnemonics to enhance the learning.

The student’s recall capacity improved significantly shown from the p value ($P < 0.0001$). [Table 1 and Graph 1] This may be because mnemonics based on the principle that human mind more easily remembers spatial, personal, surprising, humorous meaning information than arbitrary sequences. Our brains evolved to code and interpret complex stimuli such as images, colors, structures, sounds, smells, tastes, touch, positions, emotions and languages. Our memories store all of these very effectively. Unfortunately, we have to remember complex arguments written on a paper, our brains do not easily encode written information, making it difficult to remember. Mind remember information using vivid mental images and because of images are vivid, they are easy to recall when you need them.

Feedbacks analysis was done on the basis of 5 points Likert scale by

applying Kruskal Wallis test ($P < 0.0001$) [Table 2 and Graph 2, 3] which shows most of the students agree or strongly agree for feedback questionnaire. This may due to there are three main styles of learners - visual, auditory, kinaesthetic. No-one uses one of the styles exclusively. Visual learners relate most effectively to written information, notes, diagrams and pictures. Auditory learners relate most effectively to the spoken word. Kinaesthetic Learners learn effectively through touch and movement and space, and learn skills.(5) All three style can covered in mnemonics so the most of students accepted it.

Similarly analysis of percentage of each question was done. [Table 3 and Graph 4] Obtained feedbacks results suggest that in addition to the cognitive effectiveness of mnemonics in increase recalling, mnemonics might also creates learning easier, more funny and enhance the learning process. Sometimes mnemonics fails because, typically students may forget things that they have coded with mnemonics if the images are not vivid enough, or if the images they used do not have enough meaning or strength. [Table 4] Research findings provide evidence that instruction involving the use of mnemonic devices does enhance

a student's formal reasoning skills and this has the potential for application of knowledge to more varied tasks.(6) In addition, the use of mnemonics with college age students might have enough potential for making learning easier and possibly more fun.(7) It should be noted that students who are trained mnemonically also perform better on comprehension tests of that specific content.(8)

Conclusion:

Study shows that mnemonics enhance learning process and improves recall capacity of the students. Mnemonics help to make hard study task easy with stress less environment. Use of mnemonics can gives new direction to study the Ayurvedic text.

Ethical Considerations:

This study is conducted according to IEC as there will not be any harm to students in participating in the study. Taking part in the study will be voluntary for students and not mandatory. Their MCQs and feedback scores were exclusively used for the research purpose.

Limitations:

- Only one batch included in the study with small sample size.
- Mnemonics have some limitations that should not replace traditional methods completely but proves useful tool especially during stressful situations.
- Some students may get confused while using mnemonics due to lack of strong and vivid images.

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