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A study to evaluate the Effectiveness of Memory Enhancement Technique on Memory Retention among Nursing Students at Selected College of Bangalore.

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ABSTRACT

Memory is the mind's ability to encode, retain, and retrieve information—an indispensable foundation for learning. Memory plays a vital role in the academic and professional life of nursing students. However, one of the most commonly cited challenges among students is the difficulty in retaining large amounts of academic material, primarily due to a lack of formal training in effective memory and recall strategies. This quasi-experimental study evaluated the impact of Memory Enhancement Techniques (METs), particularly mnemonics, on memory retention among 60 first-semester B.Sc. nursing students in Bangalore. Memory retention was assessed using the Multi factorial Memory Questionnaire before and after administering a structured mnemonic exercise. Initially, only 10% of students demonstrated good memory strategies, while 47% showed poor strategies. After the intervention, 62% exhibited good memory strategies, and only 2% had poor strategies. Statistical analysis revealed a significant improvement in memory retention post-intervention ($p = 0.000$). These results suggest that mnemonics are an effective method for enhancing memory retention in nursing students. The study highlights the importance of incorporating METs into nursing education to improve students' academic performance and learning outcomes.

Introduction:

In psychology, memory is the cognitive process of acquiring, storing, retaining, and retrieving information.1 The American psychological Association defined "Memory as the ability to retain information or a representation of past experience, based on the mental processes of learning or encoding, retention across some interval of time, and retrieval or reactivation of the memory"2.

Memory is a core cognitive function, essential for learning, decision-making, and maintaining personal identity. Memory plays a vital role in a student's capacity to learn, excel academically, and cultivate essential life skills. It underpins the acquisition and practical use of knowledge, aids in managing schoolwork, strengthens social engagement, and supports holistic cognitive and emotional growth.3

Memory enhancement techniques (METs)—such as acronyms, acrostics, and chunking—have been explored in various contexts as strategies to improve memory and cognitive function. This is a multidimensional approach that involves the use of mnemonic strategies commonly adopted by students to facilitate the recall of learned information. It provides a simple method of remembering by associating the required term with an idea through various techniques.4The primary aim is for students to use memory enhancement strategies to improve learning, retention, and exam performance. Despite memory's importance in nursing education, research on such techniques in nursing students is limited.

Various steps of nursing procedures can be easily remembered with mnemonics Four-point physical assessment of a disease can be easily remembered with "I Am a People Person" which resembles Inspection, Auscultation, Percussion, Palpation respectively. Mnemonics can compile all the symptoms of a disease/ process in one word which aid us to improve memory. By Mnemonics methods, any given information can be memorized using principles of organization, attention, association and visualization.[5]

The primary objective of this study is to assess memory retention among nursing students and to

determine the effectiveness of memory enhancement techniques in improving their memory The findings of this study are expected to contribute to the development of evidence-based strategies to enhance memory in nursing education, thereby improving students' academic outcomes and professional performance.

Need of the Study:

Nursing education's extensive and complex content makes perfect retention challenging. Effective memory retention is essential for nursing students to master both theoretical and clinical knowledge.

Researchers estimated that 5–15% of college students face issues with retaining information, falling behind in coursework, and forgetting what they've learned. One study documented that 46.6% of surveyed university students identified memory difficulties as a significant academic concern.[6]

A total of 64.9% of the sample exhibited a moderate level of digital amnesia, whereas a high level was observed in only 4.8% of participants.7News reports on Indian research indicate that 40% of medical students experienced forgetfulness, which was associated with smartphone use.8

Subramanian and Renuka (2021) conducted a pre-experimental study at Kasturba Gandhi Nursing College, Puducherry, to evaluate the effectiveness of a Memory-Enhancement Technique (MET) among 95 second-year B.Sc. Nursing students. Using convenience sampling and a structured questionnaire, they found that while 72.6% had average memory retention in the pretest, posttest scores significantly improved (mean increased from 50.74 to 58.75; $p < 0.0001$). The study concluded that MET effectively enhances memory retention and academic performance.[9]

Kaur (2022) conducted an experimental study in Punjab to assess the impact of mnemonics on memory among 97 third-year B.Sc. Nursing students. Participants were randomly assigned to an experimental group (n=60), taught with mnemonics, and a conventional group (n=37). Post-tests on days 7 and 28 showed significantly higher memory scores in the experimental group ($t = 5.858$, $p < 0.001$; $t = 7.198$, $p < 0.001$). The study concluded that mnemonics effectively enhances memory retention and long-term learning in nursing education[10].

Many nursing students face difficulty retaining subject-specific terminology due to the high volume of content. To address this, tailored mnemonics were developed and implemented to enhance learning and retention. This study aims to evaluate the effectiveness of selected memory enhancement techniques on memory retention among nursing students in a selected college.

Objectives:

The objectives of the study are

- To assess the level of memory retention of Nursing students.
- To assess the memory retention strategies employed by nursing students.
- To evaluate the effectiveness of the memory enhancement technique on memory retention among Nursing students
- To find the association between memory retention strategy and selected socio-demographic variables.

Hypothesis:

▶ H1: There is a significant difference in the pre-test and post-test score on memory retention among the students.

▶ H2: There is a significant association between the effects of METs on memory with selected socio demographic variables.

Methodology:

Research Design:

The chosen research design for the present study is a pre-experimental research design

Sample:

1st semester BSc. Nursing students make up the sample of this study.

Sampling techniques:

A Convenient sampling technique is used for selecting the samples for the study.

Inclusion criteria:

Nursing students who are

Present at the time of the study are included.

Studying in the first semester of B.Sc. Nursing.

Able to read and understand English

Description of the tool

Data collection tools refer to the methods or instruments used by the researcher to observe or measure the essential variables in the research problem.

The tool comprises:

Section A: Sociodemographic details of samples

Section B:

A standardized tool, the Multifactorial Memory Questionnaire (MMQ), was used to assess three domains: Satisfaction, Ability, and Strategy.

Scoring key:

The tool consists of 57 questions.

Satisfaction scoring: This domain consists of 18 questions, each of the 18 statements was evaluated based on the degree of agreement. The total possible score ranged from 0 to 72, with higher scores reflecting greater levels of satisfaction. Responses were measured using a five-point Likert scale comprising 'strongly agree,' 'agree,' 'undecided,' 'disagree,' and 'strongly disagree,' assigned scores of 4, 3, 2, 1, and 0, respectively, depending on the positive or negative framing of the items.

Ability scoring:The domain comprised 20 questions, with a total score ranging from 0 to 80. Each item was rated on a five-point scale with the response options 'all the time,' 'often,' 'sometimes,' 'rarely,' and 'never,' assigned scores

of 0, 1, 2, 3, and 4, respectively.

Strategy scoring: The instrument comprised 19 items, yielding a total score range of 0 to 76. Responses were recorded on a five-point Likert scale with the options 'all the time,' 'often,' 'sometimes,' 'rarely,' and 'never,' which were assigned scores of 4, 3, 2, 1, and 0, respectively.

Section C:

A structured, mnemonic exercise—comprising five nursing-related mnemonic tasks, each scored on a 0–3 scale (total possible score: 15)—was employed to evaluate students' baseline memory retention strategies. For each correct answer the participants were awarded with the score 3 and for every wrong answer they awarded with score of „0. " If the response of the item is missed participants were awarded with score „0. Following this, a targeted instructional intervention was delivered, introducing and modeling three evidence-based memory enhancement techniques: Acrostics, Acronyms, and Chunking, with nursing-specific exemplars. The identical assessment was re-administered post-intervention.

Table-1.2: Interpretation of structured mnemonic exercise.

Sl. No.	Scores	Interpretation
1	11 – 15	Good
2	6 – 10	Average
3	0 – 5	Poor

Data Analysis:

The data of the study were analysed using both descriptive and inferential statistics.

Frequency, percentage distribution, mean, and standard deviation were used to describe the sample characteristics. A paired t-test was used to assess the effectiveness of memory enhancement technique on memory retention. The Chi-square test was applied to determine the association between pre-test scores and selected socio-demographic variables.

Figure 1.1: Frequency and percentage distribution of memory retention of 1st semester nursing students.

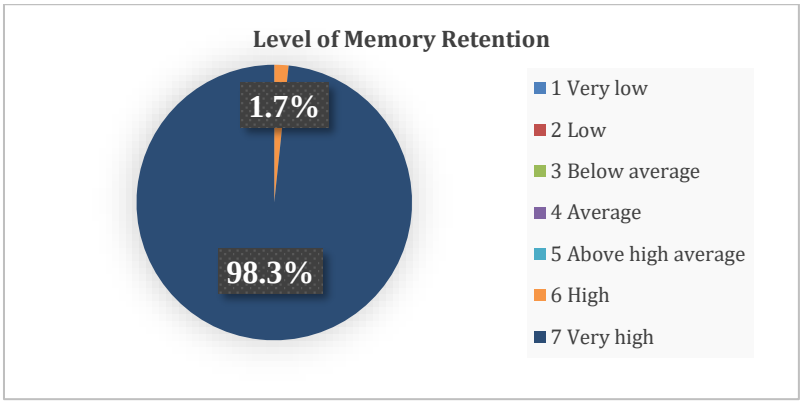

Figure 1.1: Shows that the majority of nursing students (98.3%) demonstrated a very high level of memory retention, while only a small proportion (1.7%) exhibited a high level of memory retention.

Fig. 1.2: Pre-test score of memory retention strategy.

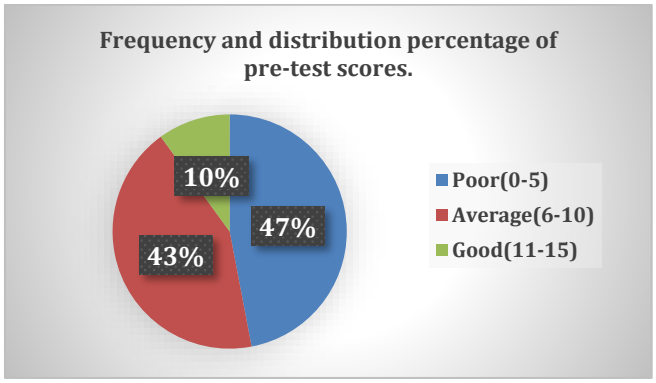

Fig.1.2: Shows that the majority (47%) of the nursing students have scored poor memory retention strategy in the pre-test, whereas 10% of the nursing students have scored good memory retention strategy.

Fig. 1.3 Post-test score of memory retention strategy.

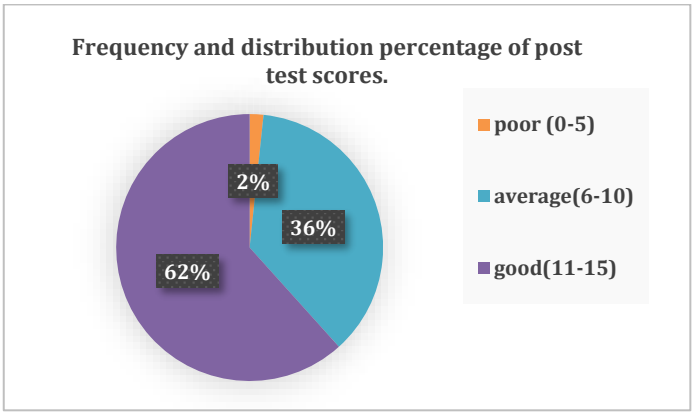

Fig.1.3: Shows that the majority (62%) of the nursing students have scored a good memory retention strategy, whereas 2% of the students have scored a poor memory retention strategy in the post-test.

Table 1.1: Effectiveness of memory enhancement techniques on memory retention.

Sl. no.	Test	Mean value	Mean difference (md)	Sd	Paired t-test	Df	Level of significance (0.05)
1.	Pre – test	5.80	-5.617	2.815	- 11.784	59	**0.000 *S**
2.	Post-test	11.42		2.999			

Table 1.1: depicts that the paired samples t-test revealed a statistically significant improvement in memory retention strategy following the intervention, with a mean difference of −5.6 (t = −11.784, p < .001).

Table 1.2: Association between level of memory retention strategy and selected socio-demographic variables.
N=60 Df=1

Sl. No.	Socio demographic Variables	Level	Of	Memory	Chi-Square (x2)	P – Value
1.	**Age**	**Good**	**Average**	**Poor**	0.037 df =1	0.947 NS
	18years	3	15	17		
	19 years	3	8	9		
	20 years	0	2	1		
	21 and above	0	1	1		
2.	**Gender**					
	Male	3	11	6	3.204	0.176
	Female	3	15	22	df=1	NS
3.	**Morning arousal time**					
	4 to 5 am	1	4	6	2.763 df=1	0.062 NS
	6 to 7 am	4	20	22		
	8 to 9 am	0	2	0		
	10am and above	1	0	0		
4.	**Estimated daily study duration**					
	1 hour	3	8	3	2.563 df=1	0.367 NS
	2hours	1	6	11		
	3 to 4 hours	2	10	12		
	4 to 6 hours	0	2	2		
5.	**Level of interest**					
	Memorizing	0	1	9	1.999 df=1	0.402 NS
	Understanding	1	9	15		
	Both memorizing and understanding	4	16	1		
	Not interested at all	1	0	1		

6.	**Attention Span**					
	Half an hour	2	9	6	0.177 df=1	0.723 NS
	1 hour	2	9	14		
	2 hours	2	4	5		
	3 hours	0	4	3		
7.	**Learning Style**					
	Visual	2	9	6	0.861 df=1	0.715 NS
	Auditory	0	1	1		
	Verbal	0	2	1		
	Group discussion	0	4	2		
	Learning independently	4	10	18		
8.	**Electronic Gadgets usage**					
	1Hour	1	4	11	6.979 df=1	**0.021 *S**
	2 Hours	2	14	10		
	3 to 4 Hours	0	5	6		
	4 to 6 Hours	1	2	1		
	More than 6 hours	2	1	0		
9.	**Psychological factors**					
	Stress	0	12	6	0.151 df=1	0.061 NS
	Anxiety	0	2	2		
	Lack of motivation	1	1	8		
	None	5	11	12		
10.	**Study Habits**					
	Quiet environment	1	11	17	2.363 df=1	0.116 NS
	Use own words when taking notes	4	9	7		
	Taking notes	1	1	3		
	Last minute cramping	0	5	1		
11.	**Study techniques**					
	Note taking	3	8	13	0.237 df=1	0.536 NS
	Active recall	0	3	3		
	Spaced repetition	1	2	2		
	Summarization	0	7	2		
	Chunking	2	6	8		
12.	**Average daily sleep hours**					
	Less than 5 hours	0	1	1	0.261 df=1	0.921 NS
	5 to 6 hours	4	13	13		
	7 to 8 hours	2	12	14		
13.	**Leisure activity involvement**					
	Reading	1	2	1	1.518 df=1	0.847 NS
	Watching movies	2	10	9		
	Listening to music	3	10	12		
	Taking naps	0	4	5		
14.	**Rate of exercise participation**					
	Less than 2 times per week	0	3	11	0.233 df=1	0.006 NS
	2 to 3 times per week	3	9	4		
	3 to 4 times per week	0	5	1		
	4 to 5 times per week	2	1	1		
	Not doing at all	1	8	11		
15.	**Dietary habits**					
	Vegetarian	1	3	12	2.309 df=1	**0.033 *S**
	Non-Vegetarian	5	23	14		
	Eggetarian	0	0	2		

Table 1.2: Presents the results of a statistical analysis indicating a significant association between the level of memory retention strategy and both electronic gadget usage and dietary habits ($p < .05$)

Result and Discussion:

The study results shown that out of 60 nursing students, majority 98.3% of the students demonstrated a very high memory retention, while 1.7% nursing student demonstrated high memory retention.

In the pre-test, the investigator found that the majority 47% of the nursing students were having poor memory retention strategy and 10% of the students were having good memory retention strategy. Memory retention strategy mean was 5.80 and the standard deviation was 2.815.

In the post test, investigator found that majority 62% of the nursing students were having good memory retention strategy and 2% nursing student was having poor memory retention strategy. Memory retention strategy mean was 11.42 and standard deviation was 2.999.

The overall mean difference of memory retention was -5.617 and paired t-test value was

-11.784. The findings of the present study revealed a significant improvement in post-test scores at the 0.05 level of significance, with the paired t-test yielding a p-value of 0.000. Hence, stated research hypothesis H1 was accepted.

. The study revealed a statistically significant association ($p < 0.05$) between the level of memory retention strategies and selected socio-demographic variables, specifically electronic gadget usage and dietary habits. Accordingly, the stated research hypothesis (H2) was accepted with respect to these variables.

Therefore, it can be concluded that the memory enhancement technique (MET) was effective in significantly improving memory retention among nursing students, independent of socio-demographic factors.

Similarly, a previous study conducted at Kasturba Gandhi Nursing College, Puducherry, also demonstrated the positive impact of memory enhancement techniques on improving memory among nursing students. These findings align with the present study, further highlighting the effectiveness of such strategies7.

In contrast , Roediger and Karpicke journal of memory tests improves long term retention (psychological science 17(3), 2006) highlighted that repeated studying enhances short-term recall, tests enhanced learning produces substantially greater long-term retention, increases students' confidence in their ability to remember the material11.

The results imply that METs are a valuable tool for nursing students to manage the vast amount of information required in their training. By leveraging these techniques, students can optimize learning and improve their ability to recall critical information, particularly in high-pressure clinical environments2. Additionally, the positive effects of METs on students' confidence and academic performance may create a ripple effect, leading to greater job satisfaction and reduced stress in their future nursing careers.

As the healthcare landscape continues to evolve, equipping nursing students with effective memory enhancement strategies is essential for helping them remain adaptable, competent, and confident professionals in an ever-changing field.

Conclusion:

The findings of the study revealed that the majority of students (98.3%) demonstrated very high memory, while 1.7% had high memory among the 60 participants. The study concluded that the intervention involving mnemonics was beneficial to the students. This research highlights the effectiveness of memory enhancement techniques (specifically mnemonics) among B.Sc. Nursing students, showing significant improvements in memory retention and recall. Incorporating such strategies into learning can potentially enhance students' academic performance.9 The findings further suggest that mnemonics can improve memory capacity, thereby supporting students in their academic pursuits.

The study also carries important implications for nursing practice, administration, and education, as memory enhancement strategies may contribute to improved professional efficiency. Future research could expand on these results by exploring the long-term effects of memory enhancement techniques as well as their broader applications in diverse educational and clinical settings.

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