



## EFFECT OF BRAIN GYM EXERCISES ON VERBAL MEMORY AMONG YOUNG WOMEN

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### ABSTRACT

**Background:** Brain gym is an instructional curriculum that intended to improve the social, mental, emotional and physical efficiency with the help of 26 moves.<sup>[9]</sup> Brain gym exercise program focuses on performing physical activities that activates the brain which enhances the cognitive function.<sup>[11]</sup> Brain gym is an innovative new approach which is applied with consistent learning purpose that aims at enhancing memory. **Aim & Objective:** The aim of the study was to assess the effect of brain gym exercises on verbal memory among young women. **Methodology:** It was an experimental study, where 40 female participants were selected based on the inclusion criteria. They were divided into two groups, namely group A (experimental group) and group B (control group). The treatment duration comprises of 40 min/day for five days per week for 4 weeks. **Outcome Measure:** Rey Auditory Verbal Learning Test. **Tools Required:** Chair, Mat, Jigsaw puzzle, Memory card game, Paper, Marker. **Result:** From the pre and post test scores it was evident that P was significant at < 0.05, hence it was proved that brain gym exercises was effective on verbal memory among middle aged women. **Conclusion:** It was concluded that brain gym exercises was effective in improving verbal memory among young women.

**KEYWORDS:** Brain gym, Verbal memory, Rey auditory verbal learning test, Cognition, Middle aged- women, cognitive deterioration.

### INTRODUCTION

Brain gym is an academic kinesiological program<sup>[2]</sup>, kinesiology is defined as the study of body's movements and relationship between the brain and body's posture and brain functioning.<sup>[18]</sup> Brain gym mainly focus on physical activities that activates the brain, thereby enhancing cognitive performance<sup>[1]</sup>, such as memory, psychological perception and cognitive skills.<sup>[2]</sup> Brain gym was developed in 1970s by dennison and dennison and it consist of a series of movements that supposedly activate the brain, promote neurological re- patterning and simplify whole brain learning.<sup>[10]</sup>

Drawing out learning through movement is what educational kinesiology is all about. A healthy and sharp mind is a key for happy and fruitful life, series of exercise can improve the brain function which makes the individual to think sharper, smarter, and more assertive.<sup>[3]</sup>

Brain gym activities has 26 basic motions and it is believed to improve the perception and stimulates the

brain hemisphere by neural remodeling to facilitate whole brain learning.<sup>[2] [7] [8]</sup> Many studies were carried out to determine the effects of brain gym on memory. Brain plasticity is a lifetime developmental process and it continues to play a significant role in older adulthood.<sup>[1]</sup>

### AIM OF THE STUDY

The aim of the study was to assess the effect of brain gym exercises on verbal memory among young women.

### RESEARCH DESIGN AND METHODOLOGY

An experimental study was conducted with 40 samples, who fulfilled the inclusion and exclusion criteria.

#### Inclusion criteria

- Age: 30 - 40 years.
- Gender: Female.
- MMSE score: 22-27 out of the maximum score 30.
- Participants who are voluntarily involving.

#### Exclusion criteria

- Participants who have not shown interest in the

study.

- History of any surgery.
- Participants with migraine headache.
- Participants with psychological condition.
- Non cooperative participants.

### OUTCOME MEASURES

Memory.

### TOOLS USED

- REY AUDITORY VERBAL LEARNING TEST.

### MATERIALS USED

- Mat.
- Paper.
- Marker.
- Chairs.
- Jigsaw puzzle.
- Memory card game.

### PROCEDURE

In this study, 40 samples were selected based on the inclusion criteria, with their informed consent. The procedure was explained to them clearly. They had been

given the rights to refuse the participation at any time. The pre and post interventional assessment was done using Rey Auditory Verbal Learning Test (RAVLT). The readings were recorded and exercise intervention was given for 4 weeks. The subjects were divided into two equal groups, group A (Experimental group) received brain gym exercises and group B (Control group) received general memory exercises with the duration of 40 minutes per day for 5 days per week for 4 weeks. The pre-test and post- tests were taken using the outcome measure.

### GROUP A [EXPERIMENTAL GROUP]

#### LATERALIZATION

#### CROSS CRAWL

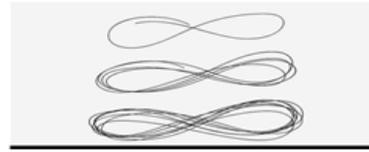
The following instructions were given to the patients  
 STEP 1: Stand straight with the legs hip width apart, shoulder rolled back, chest up and look ahead.  
 STEP 2: Lift the right hand above your head.  
 STEP 3: Lift the left leg off the floor and bend left knee.  
 STEP 4: Simultaneously, bend the right elbow and try to touch the left knee with the right elbow.  
 STEP 5: Get back to the starting position. do the same with the left hand.



Cross crawl



Hook ups



Lazy eight

#### HOOK UPS

The following instructions were given to the patients  
 STEP 1: Sit or stand straight. cross the right ankle over the left ankle.  
 STEP 2: Extend the hands in front of you, cross the right hand over the left hand and link the fingers.  
 STEP 3: Twist the forearm internally and form the hook. take six deep breaths.  
 STEP 4: Release the hook and join the fingertips and take six deep breaths.

#### LAZY EIGHT

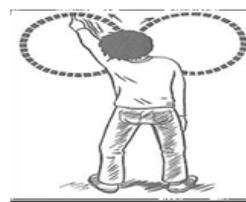
The following instructions were given to the patients  
 STEP 1: Draw a infinity symbol or horizontal eight on the white paper. STEP 2: Trace it 20 to 30 times.  
 STEP 3: Fix the eyes on the tip of the marker and trace it with your eyes while drawing the horizontal 8 or infinity symbol.

#### DOUBLE DOODLE

The following instructions were given to the patients  
 STEP 1: Stand in front of the wall, where the blank paper is taped, to draw a double doodle pattern, it can be circle or square.  
 STEP 2: Begin drawing with both the hands at the same time to create a symmetrical mirror image pattern. When the left hand goes to the left, the right hand goes to the right and when one hand comes towards the center the other also comes toward the center.  
 STEP 3: Practice holding the eyes at the center while drawing, notice what you are able to see out of the eye corners.



Double doodle



The elephant

**THE ELEPHANT**

The following instructions were given to the patients  
 STEP 1: Stand straight .keep one hand behind and extend the other above the head such that upper arm touches the ear and head.  
 STEP 2: Bend the knees and extend right hand in front.  
 STEP 3: Trace horizontal 8 or infinity symbol with the extended arm. Move upper body and eyes while doing so.

**Brain button****CENTRALIZATION****BRAIN BUTTON**

The following instructions were given to the patients  
 STEP 1: Place the left palm on belly.  
 STEP 2: Place the thumb and index finger of right hand an inch below collarbone. Move the fingers in circular motion. repeat this 10 times.  
 STEP 3: Place the right palm on belly, left fingers an inch below the collarbone and massage in circular motion. Repeat this for 10 times.

**Earth button****EARTH BUTTON**

The following instructions were given to the patients  
 STEP 1: Stand or sit down comfortably.  
 STEP 2: Place one hand under the lower lip.  
 STEP 3: Place the other hand palm over the navel position.

STEP4: Now rub both the upper and lower body parts in a small circular motion.

**THINKING CAP**

The following instructions were given to the patients.



STEP 1: Sit on a chair. place the index finger and thumb on your ear.  
 STEP 2: Massage top of the ear and gradually come to the auricle.  
 STEP 3: Massage from back to the top of ear.

**BALANCE BUTTON**

The following instructions were given to the patients  
 STEP 1: Place two fingertips behind one ear about three finger widths away from the ear.  
 STEP 2: Place the other hand on the navel.  
 STEP 3: Deep breath and hold for 30 seconds.

**Balance button****Energetic yawn****ENERGETIC YAWN**

The following instructions were given to the patients

STEP 1: Place the index finger and middle finger of each hand on the jaw joint.

STEP 2: Open the mouth and start massaging the joints in a circular motion. do this for five times.

STEP 3: Five close your mouth and massage for five times.

#### GROUP B [CONTROL GROUP]

- PLAYING JIGSAW PUZZLE
- BUILDING THE VOCABULARY
- DANCE YOUR HEART OUT
- USE ALL YOUR SENSES
- LEARNING A NEW SKILL

- TEACH A NEW SKILL
- LISTEN TO OR PLAY MUSIC
- MEDITATE
- SLEEP
- PLAYING MEMORY CARD GAMES

#### DATA ANALYSIS

The data analysis is done through two methods.

- Descriptive statistics
- Inferential statistics

TABLE 1

Table 1: Mean and Standard Deviation of RAVLT in Experimental Group (A)

RAVLT TEST	Trial 1		Trial 2		Trial 3		Trial 4		Trial 5		Trial 6		Trial 7		Trial 8			
	PRE TEST	POST TEST																
Mean	2.35	4.95	3.4	6.5	4.05	7.7	4.8	8.95	5.1	10.05	2.8	5.2	2.35	6.55	2.7	7.35	3	7.5
SD	0.81	0.76	1.05	1.00	1.15	1.03	0.77	1.10	0.97	1.15	0.62	0.89	0.59	1.39	0.73	1.69	0.79	1.67

Table 2: Mean and Standard Deviation of RAVLT in Control Group (B)

RAVLT TEST	Trial 1		Trial 2		Trial 3		Trial 4		Trial 5		Trial 6		Trial 7		Trial 8			
	PRE TEST	POST TEST																
Mean	2.1	3.6	3.1	4.55	3.95	5.65	4.75	6.2	5.25	6.8	2.5	3.65	2.05	3.55	2.15	4.3	2.45	4.3
SD	0.45	0.50	0.64	0.89	0.76	0.67	0.79	0.89	0.85	0.83	0.51	0.59	0.69	0.69	0.37	0.80	0.51	0.80

#### RESULT

There was a significant difference in means of pre and post test in group A and B. There is a significant difference in (Group A)  $P < 0.05$ . The mean of post test immediate recall(6.55), delayed recall(7.35) and recognition memory(7.5) is greater than the pre test mean in group A. There is a significant difference in (Group B)  $P < 0.05$ . The mean of post test immediate recall(3.55), delayed recall(4.3) and recognition memory(4.3) is greater than the pre test mean in group B. When comparing the post test mean of immediate recall(group A- 6.55) (group B -3.55), delayed recall(group A-7.35) (group B- 4.3) and recognition memory(group A- 7.35) (group B- 4.3) between group A and B shows that the post test mean in group A is higher than the post test mean in group B.

#### DISCUSSION

According to this study the brain gym was efficient in improving verbal memory among young women. The Rey Auditory Verbal Learning Test (RAVLT) evaluates the declarative memory, immediate recall span, verbal learning susceptibility to proactive and retroactive interference, retention of information, recall and memory recognition(Lezak et al. 2004; Strauss et al. 2006). RAVLT has construct validity when compared with other measures of verbal learning and memory, Such as the California Verbal Learning Test (Stallings et al. 1995). RAVLT allows the evaluation of the components of acquisition and recall of information and permits investigation of serrate process (Mitrushina et al., 2005). Brain gym exercises encourage literacy ability, oral

reading comprehension, self esteem, memory, analytical thought, imaginative thinking (Keith J. Hyatt. 2007). Brain gym exercises reduces the stress, anxiety, and depression (Vaishnavi V Siroya et al. 2021)

In this study, The outcome of the analysis has proven that brain gym program is beneficial in improving verbal memory.

#### CONCLUSION

The study showed that both the groups namely, group A and B had improvement in verbal memory. However it is, experimental group was more effective than the control group and hence, it was concluded that brain gym exercises was effective in improving verbal memory among young women.

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