

# Effectiveness of 12-week Om chanting on reaction time and spatial and verbal memory



Aalasyam Naveen<sup>1</sup>, Vijay Kumar Sayeli<sup>2</sup>, Uma Pokala<sup>3</sup>

<sup>1</sup>Assistant Professor, <sup>2</sup>Associate Professor, Department of Pharmacology, <sup>3</sup>Associate Professor, Department of ENT, Mamata Medical College, Khammam, Telangana, India

Submission: 12-05-2022

Revision: 28-08-2022

Publication: 01-10-2022

## ABSTRACT

**Background:** Chanting Om was reported to increase the blood supply to brain structures involved in cognitive functions and improve cognition. **Aim and Objectives:** The present study was undertaken to observe the effectiveness of 12-week Om chanting on reaction time and spatial and verbal memory. **Materials and Methods:** Apparently, healthy volunteers (n = 20; nine men and 11 women) who were right-handed and were consenting to participate in the study were recruited in the study. The age range of the subjects was 25–55 years. The intervention group participants were trained for reciting OM with the help of professional yoga instructor for a week days. After a week, they were instructed to assemble at the meditation hall of the institute at sharp 6:30 am every day and recite Om chanting for 20 min. Spatial and verbal memory was assessed using the standard methods explained in the literature that is spatial and verbal memory test. Auditory and visual reaction time was assessed using RT apparatus. **Results:** Spatial, verbal memory, and reaction time in control and intervention group participants were compared in this study. There was a significant improvement in the spatial memory scores in the intervention group when compared with control group. There was a significant improvement in the auditory reaction time for high and low pitch sounds and also visual reaction time for red and green light in the intervention group when compared with control group. **Conclusion:** The study results explain significant improvement in the spatial and verbal memory scores and auditory and visual reaction time after the intervention. The study recommends further detailed studies to support practicing Om chanting for the well-being of general population.

**Key words:** Om chanting; Meditation; Memory; Reaction time

## INTRODUCTION

The present day life style is full of stress and anxiety and there is a strong need to manage this stress. Stress has adverse effect on overall quality of life. Poorly managed and constant stress has negative impact on cognitive functions.<sup>1-3</sup> In Indian tradition, any kind of meditation or yoga will begin with reciting the OM. OM chanting was reported to be practiced by Lord Shiva. It has both traditional and scientific value. It can be recited by anyone irrespective of religion. It was reported that reciting Om causes regulation of autonomic system and inhibits brain areas such as limbic system, amygdale, hippocampus, parahippocampal gyrus, insula, orbitofrontal and anterior

cingulate cortices and thalamus, and offers the relaxation.<sup>4,5</sup> Reciting OM causes a vibratory sensation around ears and the vibration is then transmitted through vagal nerves to the brain structures.<sup>6</sup> Chanting Om was reported to increase the blood supply to brain structures involved in cognitive functions and improve cognition.<sup>7,8</sup> Earlier studies reported a significant improvement in the spatial and verbal memory followed by chanting Om.<sup>8,9</sup> Although it is known that OM chanting has multiple beneficial effects on cognitive functions, the studies to provide scientific evidence are relatively less. Hence, the present study was undertaken to observe the effectiveness of 12-week Om chanting on reaction time and spatial and verbal memory.

### Access this article online

#### Website:

<http://nepjol.info/index.php/AJMS>

DOI: 10.3126/ajms.v13i10.45067

E-ISSN: 2091-0576

P-ISSN: 2467-9100

Copyright (c) 2022 Asian Journal of Medical Sciences



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

### Address for Correspondence:

Uma Pokala, Associate Professor, Department of ENT, Mamata Medical College, Khammam, Telangana, India. **Mobile:** +91-9948867744.

**E-mail:** umapokala221@gmail.com

### Aim and objectives

The present study was undertaken to observe the effectiveness of 12-week Om chanting on reaction time and spatial and verbal memory.

## MATERIALS AND METHODS

### Study design

The present study was an experimental study.

### Study setting

The study was conducted at Department of Pharmacology, Mamatha Medical College, Khammam.

### Study participants

Apparently, healthy volunteers (n=20; nine men and 11 women) who were right-handed and were consenting to participate in the study were recruited in the study. The age range of the subjects was 25–55 years. Two qualified male and female physicians conducted complete physical examination of the subjects to exclude any serious medical complications. The study protocol was approved by the Institutional Human Ethical Committee (IEC/IRB NO: 84/21). Written, voluntary informed consent was obtained from all the participants before the study. After obtaining the consent, the participants were randomly grouped into two groups with ten participants in each group. The participants in the control group were not allowed to practice Om chanting during the study duration. After the study, they were offered similar training that was provided to intervention group. After recording baseline values of spatial and verbal memory, the intervention group participants were trained for reciting OM with the help of professional yoga instructor for a week days. After a week, they were instructed to assemble at the meditation hall of the institute at sharp 6:30 am every day and recite Om chanting for 20 min under the supervision of the yoga instructor. The duration of the intervention was 12 weeks and 5 days a week. Om chanting was performed in sukhasana.<sup>9</sup> After 12 week period, spatial and verbal memory scores were recorded in both control and intervention groups and compared.

### Spatial and verbal memory test

Spatial and verbal memory was assessed using the standard methods explained in the literature that is spatial and verbal memory test.<sup>10,11</sup>

### Reaction time

Auditory and visual reaction time was assessed using the RT apparatus manufactured at Anand Agencies, Pune, India. Auditory reaction time was assessed for high and low pitch sounds and visual reaction time was assessed for green and red lights.<sup>12</sup>

### Statistical analysis

Data were analyzed using SPSS 20.0 version. Student t-test was applied to observe the significance of difference. A probability value of <0.05 was considered significant.

## RESULTS

Table 1 presents the demographic parameters and spatial, verbal memory, and reaction time in control and intervention group participants before intervention. The demographic parameters were not significantly different between control group and intervention group participants. Spatial and verbal memory scores were not significantly different between the control and intervention group participants. Auditory and visual reaction time was not significantly different between the control and intervention group participants. Table 2 presents the spatial, verbal memory, and reaction time in control and intervention group participants after intervention. There was a significant improvement in the spatial memory scores in the intervention group when compared with control group. There was a significant improvement in the auditory reaction time for high and low pitch sounds in the intervention group when compared with control group. There was a significant improvement in the visual reaction time for red and green light in the intervention group when compared with control group.

## DISCUSSION

The present study was undertaken to observe the effectiveness of 12-week Om chanting on reaction time and spatial and verbal memory. Table 1 presents the demographic parameters and spatial, verbal memory, and reaction time in control and intervention group participants before intervention. The demographic parameters were not significantly different between control group and intervention group participants. Spatial and verbal memory scores were not significantly different between the control and intervention group participants. Auditory and visual reaction time was not significantly different between the control and intervention group participants. Table 2 presents the spatial, verbal memory and reaction time in control and intervention group participants after intervention. There was a significant improvement in the spatial memory scores in the intervention group when compared with control group. There was a significant improvement in the auditory reaction time for high and low pitch sounds in the intervention group when compared with control group. There was a significant improvement in the visual reaction time for red and green light in the intervention group when compared with control group.

**Table 1: Demographic parameters and spatial, verbal memory and reaction time in control and intervention group participants before intervention**

Parameters	Control group (n=10)	Intervention group (n=10)	P value
Age (years)	32±4	30±2	0.1744
Height (cm)	148.6±20.46	144.11±28.76	0.6922
Weight (kg)	68.22±4.97	70.55±8.12	0.4490
Spatial memory	4.66±2.1	4.24±1.7	0.6290
Verbal memory	3.22±1.4	3.8±1.56	0.3931
Visual reaction time green (ms)	0.26±0.04	0.28±0.08	0.4886
Visual reaction time red (ms)	0.24±0.07	0.27±0.02	0.2090
Auditory reaction time high pitch (ms)	0.36±0.18	0.42±0.12	0.3920
Auditory reaction time low pitch (ms)	0.32±0.10	0.38±0.12	0.2402

Data were presented as mean and SD

**Table 2: Spatial, verbal memory, and reaction time in control and intervention group participants after intervention**

Parameters	Control group (n=10)	Intervention group (n=10)	P value
Spatial memory	4.52±1.8	6.88±2.1	0.0147*
Verbal memory	3.44±1.2	6.18±2.4	0.0047*
Visual reaction time green (ms)	0.22±0.01	0.14±0.008	0.0001**
Visual reaction time red (ms)	0.26±0.02	0.12±0.002	0.0001**
Auditory reaction time high pitch (ms)	0.32±0.14	0.21±0.03	0.0258*
Auditory reaction time low pitch (ms)	0.38±0.10	0.22±0.08	0.0009**

Data were presented as mean and SD. \*P&lt;0.05 is significant. \*\*P&lt;0.01 is significant

Practicing yoga, meditation, and chanting mantras was reported to be highly effective in improving physical and psychological health.<sup>13</sup> Om chanting was a powerful respiratory exercise that improves pulmonary functions also.<sup>14</sup> Significant improvement in the vagal activity and decreased heart rate was reported followed by the Om chanting.<sup>15</sup> Om chanting offer relaxation and it may be due to inhibition of the brain areas. Om chanting was reported to stimulate the areas of the brain associated with the cognitive functions. Spatial and verbal memory and reaction time were the parameters which are essential in our day to day life. These parameters will be affected in the patients with neurological disorders. Om chanting was found to be very effective in improving the cognitive functions.<sup>16,17</sup> The present study results were in accordance with earlier studies as we have observed significant improvement in the spatial and verbal memory as well as reaction time.

### Limitations of the study

The results of the study may not be generalized as the study was conducted at one center. Although it is known that Om chanting offer multiple beneficial effects, scientific literature to support is less. Hence, large scale studies have to be undertaken to fill this gap.

### CONCLUSION

The study results explain significant improvement in the spatial and verbal memory scores and auditory and visual

reaction time after the intervention. The study recommends further detailed studies to support practicing OM chanting for the well-being on general population.

### ACKNOWLEDGMENT

Authors would like to extend their thanks to the Dean & Principal and also thankful to the professor and HOD, department of pharmacology for allowing us to conduct the study. Authors are also extremely grateful to the faculty of pharmacology department for their support during the entire study period.

### REFERENCES

1. Andel R, Crowe M, Kareholt I, Wastesson J and Parker MG. Indicators of job strain at midlife and cognitive functioning in advanced old age. *J Gerontol B Psychol Sci Soc Sci.* 2011;66(3):287-291. <https://doi.org/10.1093/geronb/gbq105>
2. Korten NC, Sliwinski MJ, Comijs HC and Smyth JM. Mediators of the relationship between life events and memory functioning in a community sample of adults: Life events, memory functioning, and possible mediators. *Appl Cogn Psychol.* 2014;28(5):626-633. <https://doi.org/10.1002/acp.3043>
3. Wilson RS, Arnold SE, Schneider JA, Li Y and Bennett DA. Chronic distress, age-related neuropathology, and late-life dementia. *Psychosom Med.* 2007;69(1):47-53. <https://doi.org/10.1097/01.psy.0000250264.25017.21>
4. Rao NP, Deshpande G, Gangadhar KB, Arasappa R, Varambally S, Venkatasubramanian G, et al. Directional brain networks underlying OM chanting. *Asian J Psychiatr.*

- 2018;37:20-25.  
<https://doi.org/10.1016/j.ajp.2018.08.001>
5. Kumar S, Nagendra H, Manjunath N, Naveen K and Telles S. Meditation on "OM": Relevance from ancient texts and contemporary science. *Int J Yoga*. 2010;3(1):2-5.  
<https://doi.org/10.4103/0973-6131.66771>
  6. Kraus T, Hosl K, Kiess O, Schanze A, Kornhuber J and Forster C. Bold fMRI deactivation of limbic and temporal brain structures and mood enhancing effect by transcutaneous vagus nerve stimulation. *J Neural Transm (Vienna)*. 2007;114(11):1485-1193.  
<https://doi.org/10.1007/s00702-007-0755-z>
  7. Kalyani BG, Venkatasubramanian G, Arasappa R, Rao NP, Kalmady SV, Behere RV, et al. Neurohemodynamic correlates of "OM" chanting: A pilot functional magnetic resonance imaging study. *Int J Yoga*. 2011;4(1):3-6.  
<https://doi.org/10.4103/0973-6131.78171>
  8. Naidu KL, Rao PM, Sailesh KS, Gopinath A, Mishra S, Ashok S, et al. Beneficial effects of 12-week OM chanting on memory in school children. *World J Pharm Sci*. 2014;2(12):1969-1971.
  9. Amin A, Kumar SS, Rajagopalan AA, Rajan SS, Mishra S, Reddy UK, et al. Beneficial effects of OM chanting on depression, anxiety, stress and cognition in elderly women with hypertension. *Indian J Clin Anatomy Physiol*. 2016;3(3):253-255.  
<https://doi.org/10.5958/2394-2126.2016.00056.6>
  10. Naveen KV, Nagarathna R, Nagendra HR and Telles S. Yoga breathing through a particular nostril increases spatial memory scores without lateralized effects. *Psychol Rep*. 1997;81(2):555-561.  
<https://doi.org/10.2466/pr0.1997.81.2.555>
  11. Baddeley AD. *Your Memory a User's Guide*. New York: Avery; 1993.
  12. Rajagopalan A, Kumar SS and Mukkadan JK. Effect of vestibular stimulation on auditory and visual reaction time in relation to stress. *J Adv Pharm Technol Res*. 2017;8(1):34-38.  
<https://doi.org/10.4103/2231-4040.197390>
  13. Bernardi L, Sleight P, Bandinelli G, Cencetti S, Fattorini L, WdowczykSzulc J, et al. Effect of rosary prayer and yoga mantras on autonomic cardiovascular rhythms: Comparative study. *BMJ*. 2001;323(7327):1446-1449.  
<https://doi.org/10.1136/bmj.323.7327.1446>
  14. Mooventhan A and Khode V. Effect of Bhramari pranayama and OM chanting on pulmonary function in healthy individuals: A prospective randomized control trial. *Int J Yoga*. 2014;7(2):104-110.  
<https://doi.org/10.4103/0973-6131.133875>
  15. Telles S, Nagarathna R and Nagendra HR. Autonomic changes during "OM" meditation. *Indian J Physiol Pharmacol*. 1995;39(4):418-420.
  16. Telles S and Desiraju T. Recording of auditory middle latency evoked potentials during the practice of meditation with the syllable "OM". *Indian J Med Res*. 1993;98:237-239.
  17. Ghaligi S, Nagendra H, Bhatt R, Vivekananda S, Bhawan E, Circle G, et al. Effect of Vedic chanting on memory and sustained attention. *Indian J Tradit Knowl*. 2006;5(2):177-180.

**Authors Contribution:**

**AN-** Concept and design of the study, results interpretation, review of literature, and preparing first draft of manuscript. **VS-** Concept and design of the study, statistical analysis and interpretation, and revision of manuscript. **UP-** Concept and design of the study, review of literature, and revision of manuscript.

**Work attributed to:**

Department of Pharmacology, Mamata Medical College, Khammam, Telangana, India.

**Orcid ID:**

Dr. Aalasyam Naveen - <https://orcid.org/0000-0002-8758-9676>  
 Dr. Vijay kumar Sayeli - <https://orcid.org/0000-0002-6846-1829>  
 Dr. Uma Pokala - <https://orcid.org/0000-0001-6112-0987>

**Source of Funding:** None, **Conflicts of Interest:** None.