An Empirical Examination of Cognitive Enhancement through Sustained Om Mantra Repetition Over 84 Weekdays: Implications for Memory Systems and Reaction Dynamics

Surender[1], Harsh Nandan[2], Anita Ranawat[3]
[1]Ph.D. Scholar, MSc Yoga and Consciousness,
[2]Ph.D. Scholar, MA Yoga,
[3]Associate Professor, Tantia University

Abstract: It has been said that chanting Om boosts blood flow to brain regions that are responsible for cognitive processes and enhances cognition. Goals and Objectives: The purpose of this research was to examine the impact of a 84 Day regimen of Om chanting on response time, spatial, and verbal memory. Materials and Methods: Twenty participants in the study—nine males and eleven women—were chosen based on their apparent health, right-handedness, and willingness to participate. The study participants ranged in age from 25 to 55. Participants in the intervention group received a week's worth of training in reciting OM under the guidance of a certified yoga teacher. They were instructed to gather in the institute's meditation hall at precisely 5:00pm. every day for a week and practice Om chanting for 20 minutes. The literature that outlines the spatial and verbal memory test approach was used to evaluate spatial and verbal memory. Using RT equipment, auditory and visual reaction time was measured. Results: The study compared reaction time, spatial, and verbal memory between participants in the intervention and control groups. In comparison to the control group, the intervention group's spatial memory scores showed a notable gain. Compared to the control group, the intervention group showed a marked improvement in auditory response time to high and low pitch sounds as well as visual response time to red and green light. Conclusion: The study findings explain the significant improvement in auditory and visual reaction time, spatial and verbal memory scores following the intervention. To promote the well-being of the general public, the study suggests additional in-depth studies to back the practice of Om chanting.

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

I. INTRODUCTION

It's critical to manage the stress and worry that characterize modern living. The overall quality of life is negatively impacted by stress. Poor management and persistent stress have a detrimental effect on cognitive skills.1-3 The OM is recited at the start of every form of meditation or yoga in Indian culture. It is said that Lord Shiva performed OM chanting. It has both scientific and traditional worth. Anyone, regardless of their religious beliefs, may recite it. It has been reported that chanting Om promotes relaxation, regulates the autonomic system, and suppresses brain regions including the limbic system, amygdala, hippocampus, parahippocampal gyrus, insula, thalamus, orbitofrontal cortex, and anterior cingulate cortex.4,5 Reciting OM causes a vibratory sensation around the ears, which is subsequently carried by vagal nerves to the brain structures.6 Chanting Om was said to boost blood flow to the brain centers responsible for cognitive function and enhance cognition.7,8 Om chanting was found in previous studies to be followed by a marked increase in verbal and spatial memory.8,9 The current research was conducted to investigate the impact of 84 days of Om chanting on reaction time and spatial and verbal memory, even though it is well understood that it has several positive impacts on cognitive processes.

Aim and objectives:
The purpose of this experiment was to see how well 84 days Om mantra chanting program affected reaction time as it verbal and spatial memory.

Statistical analysis:
The information was analyzed with SPSS 20.0. To ascertain the significance of the discrepancy, the student t-test was used. Less than 0.05 was used to assess significance based on a probability value.

II. MATERIALS AND METHODS

Study design
The present study was an experimental study.

Study participants:
The study included nine males and eleven women among twenty right-handed, fit volunteers ready to take part. The subjects ranged in age from 25 to 55; two skilled male and female physicians performed a thorough physical checkup to rule out any significant medical issues. Before the trial, written, voluntary informed permission was obtained from all participants; the Institutional Human Ethical Committee authorized the study technique (IEC/IRB NO: 84/21). Once authorization was granted, the ten-member teams among the participants were randomly divided. The subjects in the control group were prevented from Om chant throughout the study. Following the study, they got similar training as the intervention group. Following baseline assessments of their verbal and spatial memory, the intervention group members were guided for a week days in reciting OM with help from a qualified yoga instructor. For a week, every day they were instructed to meet at the institute's meditation room and do 20 minutes of Om chanting at exactly 5:00pm under the tutelage of the yoga instructor. The therapy ran 84 days and all week days. Om chanting was performed using the sukhasana posture; at the end of twelve weeks, spatial and verbal memory scores from both treatment and control groups were gathered and analyzed.

Spatial and verbal memory test
Standard methods that are explained in the literature—the spatial and verbal memory test—were used to evaluate verbal and spatial memory.10,11

Reaction time
Auditory and visual reaction time were measured using the RT apparatus made by Anand Agencies in Pune, India. While the auditory response time to low and high pitches was also measured, the visual reaction time to red and green lights was assessed.

Statistical analysis
Data were examined using SPSS 20.0 version. The statistical significance of the difference was calculated using the student t-test. Any probability figure under 0.05 was regarded as significant.

III. RESULT

The demographic characteristics, spatial, verbal memory, and reaction time of individuals in the control and intervention groups prior to the intervention are shown in Table 1. Between the individuals in the intervention group and the control group, the demographic characteristics were not considerably different. There were no significant differences in spatial and verbal memory scores between the individuals in the control and intervention groups. There were no significant differences in auditory and visual reaction time between the participants in the control and intervention groups. In the control and intervention groups, the reaction time, verbal memory, and spatial memory were measured after the intervention, as shown in table 2. Compared to the control group, the intervention group's spatial memory scores showed a notable increase. In the intervention group, there was a notable increase in the auditory reaction time for both high and low pitch sounds as compared to the control group. The intervention group showed a large increase in visual response time to red and green light compared to the control group.

IV. DISCUSSION

Evaluating the effects of a 84 days Om chanting program on verbal memory, spatial memory, and reaction time was the goal of the present study. Table 1 presents the demographic characteristics, response time, spatial and verbal memory of the subjects in the control and intervention groups before to the intervention. The intervention and control groups' demographic profile revealed no significant

variations. Between the control and intervention groups, participants showed no obvious difference in verbal and spatial memory scores. Between the intervention and control groups, there was no statistically significant variation in auditory or visual reaction time. Table 2 shows the response time, verbal memory, and spatial memory of participants in the control and intervention groups after the intervention. Compared to the control group, the spatial memory results of the intervention group showed a significant improvement. Compared to the control group, the intervention group's auditory response time for both high and low pitch sounds significantly improved. The intervention group had a significant rise in the visual response time for red and green light relative to the control group. Yoga, meditation, and mantra chanting are said to be quite helpful in improving one's mental and physical health.13 Om chanting, which also enhances pulmonary function, proved to be an excellent respiratory exercise.14 Notable changes in vagal activity and a decreased heart rate followed the Om chanting.15 Suppressed of particular brain areas may explain how chanting Om promotes relaxation. Reports indicate that reciting Om stimulates brain regions associated with cognitive functions. Verbal and spatial memory, response time, are among the factors most important to our daily existence. Patients with neurologic disorders may see alterations in these values. Enhancement of cognitive abilities was found to be greatly aided by om chanting. 16, 17 The results of this study were in line with earlier studies as we saw a significant improvement in reaction time, spatial and verbal memory.

Limitations of the study:

The study's findings cannot be extrapolated because it was carried out at only one institution. Despite the well-established advantages of chanting Om, scientific evidence to back this is lacking. As a result, massive investigations must be conducted in order to close this gap.

V. CONCLUSION

After the treatment, the study results show a notable improvement in verbal and spatial memory scores as well as in auditory and visual response time. For the sake of the general public's well-being, the study suggests conducting more thorough research to back up the practice of OM mantara chanting.

VI. ACKNOWLEDGMENT

The authors would like to express their gratitude to the Dean as well as their appreciation to the professor and head of the pharmacology department for giving us permission to carry out the research. The authors are also incredibly appreciative of the assistance provided by the faculty of the pharmacology department throughout the course of the research.

REFERENCE

[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, WdowczycSzulc 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 Vedicchanting on memory and sustained attention. Indian J Tradit Knowl. 2006;5(2):177-180.