This journal is the official publication of Bangladesh Society of Physiologists (BSP)
Web URL: www.banglajol.info/index.php/JBSP

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pISSN-1983-1213; e-ISSN-2219-7508

79569

Article

Article information:
Received: Dec 2023
Accepted: April 2024
DOI:https://doi.org/10.3329/jbsp.v19i1.79569

Corresponding author:
Sai Sailesh Kumar Goothy, Department of Physiology, NRI Institute of Medical Sciences, Visakhapatnam, Andhra Pradesh E-mail: dr.goothy@outlook.com

Cite this article:
Venkatesha PB, Khalid JP, Goothy SSK, Sathianesan B, Rajagopalan V, Kurien MJ. Effect of structured OM chanting and listening on cognitive functions in young adults. J Bangladesh Soc Physiol 2024;19(1): 23-28

Effect of structured OM chanting and listening on cognitive functions in young adults

Padmanabha Baburayanakoppulu Venkatesha[1], Jabir Padathpeedika Khalid[2], Sai Sailesh Kumar Goothy,[3] Bethiun Sathianesan[2], Vijayaraghavan Rajagopalan[4], Mukkadan Joseph Kurien[4]

1. Department of Physiology, Northern Border University, Arar, KSA.
2. Department of Physiology, Saveetha Medical College, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India.
3. Department of Physiology, NRI Institute of Medical Sciences, Visakhapatnam, Andhra Pradesh, India.
4. Little Flower Medical Research Centre, Angamaly, Kerala, India.

Abstract

Background: OM chanting was reported to improve parasympathetic activity and offer relaxation. This is due to the vibration effect created during the chanting of OM. There is a need to motivate medical students to practice and implement yoga and meditation to overcome the stress they face during their course. This also helps to improve cognitive functions and helps them to develop their academic performance as well. **Objectives:** To investigate the impact of Om chanting on cognitive abilities of healthy young adults. **Methods:**This experimental study was carried out on 40 young healthy volunteers aged 18-24 years, both male and female. After obtaining voluntary, written, informed consent 20 subjects were randomly assigned to experimental group and 20 were control. The experimental group received an initial training in structured Om chanting and then performed OM chanting daily for 12 weeks. The control participants were not under OM for this 12 weeks of follow up period. Both before and after the intervention, the control and intervention groups were assessed for their cognitive abilities by spatial and verbal memory test and Generalized Anxiety Disorder score (GAD-7). Statistical analysis was done by students un paired t test. **Results:** Demographic data of the participants was not significantly different when

compared between the control and experimental groups. Spatial, verbal memory scores and GAD-7 scores were almost similar in both control and intervention groups at baseline. Significant improvement was observed in the spatial and verbal memory scores and significant decrease in the anxiety scores was also observed in the experimental group participants after 10 weeks of OM chanting. **Conclusion:** Structured OM chanting may be effective to increase cognitive functions and reduce anxiety in young healthy volunteers.

Keywords: OM chanting, Anxiety, Stress, Cognitive functions, Young adults, Meditation

Introduction

Combining syllables, A, U, and M comprises OM. In Hindu tradition, OM chanting has a very sacred place. Before starting any mantra Om precedes. OM chanting is part and parcel of all Yoga techniques. OM chanting was reported to improve parasympathetic activity and offer relaxation. This is due to the vibration effect created during the chanting of OM.[1-2]These vibrations are transmitted via the vagus nerve activate the vagal centers and simultaneously deactivate the stress axes. OM chanting was reported to regulate emotions by activating the prefrontal cortex and deactivating the amygdala.[3] OM chanting is being practiced in ancient times in Hinduism. However, in recent years scientific investigations about the Om chanting have started.[4-6]OM chanting increased cognitive functions, especially learning and memory[7]. Hence, OM chanting exercise has multiple beneficial effects provided it is practiced in long term and regular basis. In recent years, National Medical Commission also implemented yoga practice in the curriculum and appointment of yoga teacher in medical colleges to help the students in practicing yoga and meditation. This is a great concern from the apex body towards the mental health of medical students. There is a need to motivate medical students to practice and implement yoga and meditation to overcome the stress they face during their course. This also helps to improve cognitive functions and helps them to develop their academic performance as well. Therefore, the goal of the current study is to determine how well 12-weeks of OM chanting affect young adults' cognitive abilities.

Methods

Study design

This study was experimental in design involving human volunteers

Study participants

The study included 40 young healthy adult volunteers aged 18 to 24 years of both sexes. Prior to recruitment, the participants' health status was evaluated by the physician. All participants were in good health. The participants were chosen from the Angamaly, Kerala, sattva cultural sector.

Exclusion criteria

Study participants were not allowed to participate if they had any health issues.

Sampling

Purposive sampling method was used to recruit the subjects.

Intervention

After explaining the purpose and procedure of the study and obtaining informed written consent 20 participants were randomly assigned into experimental group and 20 participants into control group. Randomization was done by using

software generated random numbers. All the participants in the experimental group performed structured OM chanting for 12 conseceutive weeks. Before intervention they received adequate training.

The detail of the Structured OM chanting and listening as follows

The structured OM chanting and listening includes the following steps. The duration of the session is 30 minutes.

Step 1 : Participants practice deep breathing in padmasana for 5 minutes

Step 2 : Participants listen to OM chanting for 10 minutes

Step 3 : Participants chant OM along with listening to OM chanting for 10 minutes

Step 4 : Participants practice deep breathing in padmasana for 5 minutes

After the recruitment and assignment of the groups, the participants were trained about the structured OM chanting for a week by a yoga instructor. Participants gathered in the meditation hall between 6:30 and 7:00 in the morning to practice systematic OM chanting and listening. The duration of each session is 30 minutes and per week there were 5 sessions. Following the training, the participants were allowed to practice structured OM chanting and listening for 12 weeks at home. During the study period, the control group participants were prohibited from practicing the program. Yet, they were given permission to resume their practice as soon as the study was over.

Data collection

At baseline and after 12 weeks of intervention and follow up cognitive functions of all participants of both group was assessed by tests of spatial and verbal memory and their anxiety status were also evaluated by the following outcome measures

Outcome measures

Assessment of spatial memory: This was assessed using a spatial memory test. In this test,10 pictures will be projected to the participant in 2 minutes. After 2 minutes he will be asked to solve a mathematical problem in one minute. Soon after one minute, he will be given two minutes to recall the pictures he has seen. Each correct answer will be given one point. The maximum score will be 10 and the minimum score is 0.[21]

Assessment of verbal memory: This was assessed using a verbal memory test. In this test, 10 words will be projected to the participant in 2 minutes. After 2 minutes he will be asked to solve a mathematical problem in one minute. Soon after one minute, he will be given two minutes to recall the words he has seen. Each correct answer will be given one point. The maximum score will be 10 and the minimum score is 0.[21]

*Assessment of anxiety:*Anxiety scores were assessed using the GAD-7 questionnaire which is a standard and self-administered questionnaire. It comprises 7 questions with options 0 to 3. The maximum score is 21 and the minimum score is 0.[22]

Statistical analysis

Data were expressed as mean ±SD. Student unpaired t test was used to compare between groups for statistical significance.

Results

In this study 22 male and 18 female subjects were included in control and experimental group**.** There was no discernible difference in the participant demographics between the experimental and control groups (table no. I). Prior to the intervention, there was no statistically significant difference in the spatial memory, verbal memory scores and GAD-7 anxiety scores between the experimental and control groups (table no II). But, after the OM chanting, the spatial and verbal memory scores were significantly higher and GAD-7 anxiety scores were significantly lower in experimental group members (table no II).

Table I: Demographic data of the participants in control and experimental groups

Parameter	Control group (n=20)	Experimental group (n=20)	P value
Age (years)	20.75±2.29	21.1±2.05	0.6136
Height (cm)	170.05±3.72	173.2±4.06	0.0146
Weight (kg)	62.4±6.48	65.65±6.22	0.1140

Data are shown as mean±SD.Statitstical analysis was done by student unpaired t test.

Table II: Spatial, verbal memory scores and GAD-7 scores in the control and experimental groups before the intervention

Parameter	Control group (n=20)	Experimental group (n=20)	P value
Spatial memory score	5.95±0.89	6.20±0.83	0.3641
Verbal memory score	5.05±0.83	5.15±0.81	0.7016
GAD-7 score	15±1.86	15.15±2.21	0.8176

Data are shown as mean±SD. Statitstical analysis was done by student unpaired t test**.**

Table III: Spatial, verbal memory scores and GAD-7 scores in the control and experimental groups after the intervention

Parameter	Control group (n=20)	Experimental group (n=20)	P value
Spatial memory score	6.10±0.85	7.75±0.72	<0.0001
Verbal memory score	5.25±0.72	6.80±0.77	<0.0001
GAD-7 score	15±1.86	11.15±0.99	<0.0001

Data are shown as mean±SD.Statitstical analysis was done by student unpaired t test.

Discussion

Our research revealed that, in comparison to the control group, the experimental group's spatial memory increased following OM chanting. These results are in line with those of several prior investigations.[8] The effectiveness of 12-week Om chanting on verbal and spatial memory was evaluated by researchers. They found that there had been a discernible improvement in the auditory and visual reaction times, as well as the verbal and spatial memory scores, after the intervention. Additionally, they claimed that improved cognition is facilitated by increased blood flow to brain areas that support cognitive processes.[8]

Our study also revealed that verbal memory scores in the experimental group were greater than in the control group following OM chanting. A prior study that demonstrated enhanced verbal memory scores following an OM chanting session lends credence to these findings.[8] Researchers found that the study group's verbal and spatial memory had significantly improved in a prior investigation. Since such training soothes the mind, they advise people to incorporate the OM chanting into their daily lives.[9]

Conversely, the experiment group's GAD-7 anxiety score decreases following OM chanting compared to the control group. These findings

are consistent with many other investigations.[10, 11, 12] In one study, the researchers found that bus drivers' anxiety decreased following a four-week session of OM chanting.[10] Stress levels in the research group significantly decreased, according to a study on the impact of OM chanting on anxiety using the DASS score.[13]

Additional advantages of OM chanting are better emotional control, higher levels of focus in school-age children, and enhanced cognitive performance.[14, 15, 16]In one study, Heart Rate Variability was used by the authors to assess the immediate impact of OM chanting on the autonomous neurological system. After five minutes of loud OM chanting, they observed a noticeable rise in high-frequency power. One element that demonstrates vagal activation is high-frequency power.[17] This indicates that one possible explanation for the aforementioned findings could be an increase in vagal tone.

Om chanting has been shown to stimulate particular brain areas associated with cognitive functions.[18, 19] The two most important areas are the hippocampus and the cerebellum. This effect on cognitive ability was further corroborated by magnetic resonance imaging studies. It is well known that hippocampus is involved in formation of long-term memory.[20] There were forty men and forty women in the current study. To confirm that OM chanting has an effect on anxiety and memory levels, more studies in different demographics and with a bigger sample size are necessary.

Conclusion

This study concluded that regular practice of structured OM chanting may be effective to increase cognitive functions and reduce anxiety. There is a strong need for further detailed studies with a recording of MRI and including more participants to generalize the results and to recommend Om chanting practice in everyday lifestyle.

Conflict of interest

None declared.

Acknowledgments

The authors would like to thank the participants for their active participation.

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