

# Beneficial Effects of Om Chanting on Spatial and Verbal Memory, Motor Skills and Pupil to Limbus Diameter (PLD) Ratio in Young Adults with Type D Personality

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**Abstract:** In 1995, Shirleyteles<sup>[2]</sup> conducted a study regarding 'autonomic changes during om meditation'. In 2005, Johandenoller<sup>[3]</sup> studied 'DS14 standard assessment of negative affectivity, social inhibition and type-d personality'. During 2010, Sanjaykumar<sup>[4]</sup> conducted a study regarding 'meditation on om: relevance from ancient texts and contemporary science'. During 2016, Aratiamin<sup>[1]</sup> conducted a study regarding 'beneficial effects of 'om' chanting on depression, anxiety, stress, and cognition in elderly women with hypertension'. In 2017, Arunasajeevan<sup>[5]</sup> found the correlation of pupil to limbus diameter ratio (pld ratio) with blood pressure and pulse rate. That much previous studies has been done regarding 'om' chanting, and type-D personality also regarding pupil to limbus diameter ratio (pld ratio). The present study was experimental. The subjects were a total of 40 young adults with type D personality, {males(n=20) and females(n=20)}. The sample size is 40. After obtaining written informed consent, the participants were screened for type D personality using DS14 questionnaire. The participants were instructed to sit in sukhasana and to inhalation deeply and then while exhaling should produce sound (chant) OM with the ability to continue until further exhalation is not possible. OM chanting once in a day at 8:00 daily at under the supervision of yoga teacher in college premises. The complete data before 'OM' chanting and after 'OM' chanting were collected subjected to statistical analysis. 1) Pupil to limbus (PLD) ratio: PLD ratio was recorded by two box method as specified in the literature<sup>6</sup> 2) Assessment of spatial and verbal memory: Spatial and verbal memory was assessed by using spatial and verbal memory test<sup>7</sup>. 3) Assessment of motor skills: Motor skills were assessed by using 100 pin dexterity test<sup>8</sup>

**Keywords:** O' Connor Tweezer Dexterity test, Pupil to Limbus Diameter (PLD) ratio, Type D personality, Negative affectivity, social inhibition

## 1. Introduction

The symbol or name of the God is OM (*Ishwara, Brahman*)<sup>9</sup>. The three letters, namely, A, U and M combined together and OM is formed<sup>10</sup>. The physical plane is represented by the letter "A", the mental and astral plane, the world of intelligent spirits, and all heavens is represented by the letter "U", the whole deep-sleep state, which is unknown even in our wakeful state is represented by the letter "M"<sup>10</sup>. The explanation about OM is well defined in one of the classical yoga texts namely Patanjali's Yoga Sutras (PYS)<sup>11</sup>. We can see a single direct mention about Pranava(OM) in PYS and it is given as Tasyavachakahpranavah (Ch: I; V: 27)<sup>12</sup>. By this we came to know that pranava is virtually Ishwara or OM, where God is represented by the word Ishwar<sup>12</sup>. Mandukya Upanishad provides us a fact regarding OM, that the past, the present, and the future is represented by the syllable OM<sup>13</sup>.

Svetasvatara Upanishad tells that we can't see the fire which is present in the firewood until two sticks are rubbed against each other and OM is just like the hidden fire, and it also reveals that body is the stick which is rubbed and OM is the stick that is rubbed against<sup>14</sup>. Bhagavad Gita reveals us an important aspect regarding the word OM that, OM is the supreme consciousness and OM is the most important subject and the greater one<sup>15</sup>. Yoga teaching says that behind

all thoughts the primary force is OM and a quiet mental state is produced by chanting or thinking about<sup>16</sup>.

The effect of OM meditation on autonomic and respiratory variables were studied in seven experienced OM meditators, the results showed a reduction in heart rate which is statistically significant during meditation and also cutaneous peripheral vascular resistance was increased which is designated as the increased mental alertness during relaxed physiological state<sup>17</sup>.

To understand the physiological effects of OM meditation a comparative study has been conducted by Telles S, Nagarathna R, and Nagendra HR in 1998. The results showed a significant decrease in the heart and breath rates. When OM alone is repeated, the skin resistance reduced significantly, which is an evidence for the minute alternations in the mental state due to the repeated meditation of OM<sup>18</sup>.

OM chanting has beneficial effects on the following aspects such as decreasing the depression, anxiety, stress, pulse rate, systolic and diastolic blood pressure and improvement in cognition<sup>19</sup>. OM chanting was reported to improve cognitive functions<sup>20</sup>.

The type D (distressed) personality profile is defined as follows: "The type D (distressed) personality profile refers

to a general propensity to psychological distress that is characterized by the combination of negative affectivity and social inhibition.<sup>21</sup> Negative affectivity and social inhibition are the main characteristic features of type-D personality (distressed)<sup>13, 22, 23</sup>. The tendency to experience negative emotions is described as Negative affectivity, it includes anxiety, anger, depressed mood and hostile feelings<sup>24, 25</sup>. The avoidance of potential dangers involved in social interactions is designated as social inhibition, it includes disapproval or non-reward by others<sup>26</sup>. When emotions get inhibited, there occurs incidence of cardiac mortality<sup>27</sup>, incidence of coronary heart disease<sup>28</sup>, long term carotid atherosclerosis<sup>29</sup>, lower heart rate variability<sup>30</sup>, lower cardiovascular recovery<sup>31</sup> and higher cardiovascular reactivity<sup>32</sup>. Individuals with type D personality are vulnerable to cardiovascular diseases<sup>33</sup>. There has been an increase in death rate of about four-fold in type-D personalities undergoing cardiac rehabilitation after all controlling the conventional risk factors<sup>34</sup>.

Previous studies shown that *OM* chanting will cause quiet mental state. Studies show that depression can be treated by stimulating vagal nerve; it can be achieved by effective *OM* chanting. Vagal nerve is stimulated by effective *OM* chanting, it produces vibration sensation around ears and it transmitted through the auricular branch of vagal nerve.<sup>35, 36, 37</sup> As scientific evidence regarding the effects of *OM* chanting are sparse, there is a need for more studies to support implementation of *OM* chanting in everyday life style.

The present study was intended to provide further evidence for the beneficial effects of *OM* chanting on spatial and verbal memory, motor skills and PLD ratio in young adults with type D personality

## 2. Methods and Materials

Present study was conducted in Department of physiology Little Flower Institute of Medical Sciences, Angamaly. The present study was approved by institutional ethical committee of Little Flower Hospital and Research Centre, Angamaly, No EC 17/2017

A total of 40 young adults with type D personality (males (n=20) and females (n=20)) were included in the present study after obtaining written, informed consent. Participants were screened for type D personality using DS 14 questionnaire.

### Inclusion criteria

- 1) Male and females within the age group of 18-25
- 2) Type D personality
- 3) Not suffering with any major disease
- 4) Not under any kind of therapy or treatment
- 5) Not practicing any other stress management technique
- 6) Willing to perform *OM* chanting regularly

### Exclusion criteria

- 1) Male and females 18<and>25 the age group
- 2) No Type D personality
- 3) Those who suffering with any major disease
- 4) Those who under any kind of therapy or treatment

- 5) Those who practicing any other stress management technique
- 6) Those who is not willing to perform *OM* chanting regularly

## 3. Methods of Data Collection

### 3.1 Chanting: *OM*

Participants will be instructed to sit in sukhasana and to inhalation deeply and then while exhaling should produce sound (chant) *OM* with the ability to continue until further exhalation is not possible. *OM* chanting will be performed *Om* chanting once in a day at 8:00 daily at under the supervision of yoga teacher in college premises for about 12 weeks.<sup>38</sup> The complete data before '*OM*' chanting and after '*OM*' chanting were collected and subjected to Student t test statistical analysis to test the significance of difference.

- Pupil to limbus (PLD) ratio: PLD ratio was recorded by two box method as specified in the literature<sup>6</sup>.
- Assessment of spatial and verbal memory: Spatial and verbal memory was assessed by using spatial and verbal memory test<sup>7</sup>.
- Assessment of motor skills: Motor skills were assessed by using 100 pin dexterity test<sup>8</sup>.

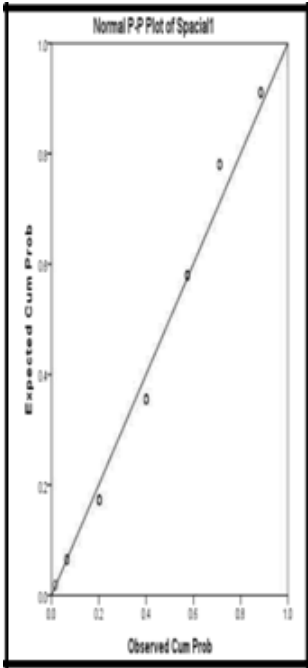
### 3.2 Statistical Analysis

The pre test and post intervention data were entered in Microsoft excel 2010 spread sheet and Data was analysed by SPSS 20.0. Student t test will be used to test the significance of difference. P<0.01 was considered as significant.

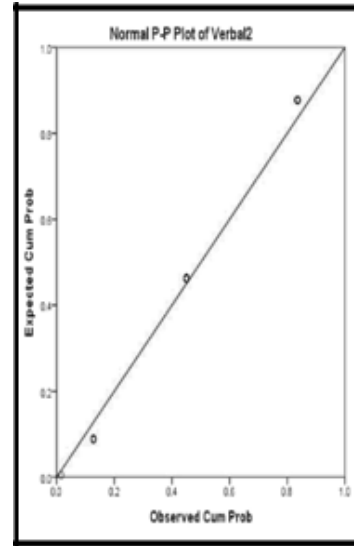
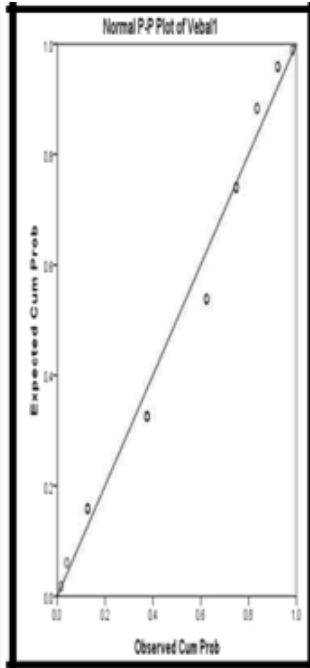
## 4. Result

Table 1

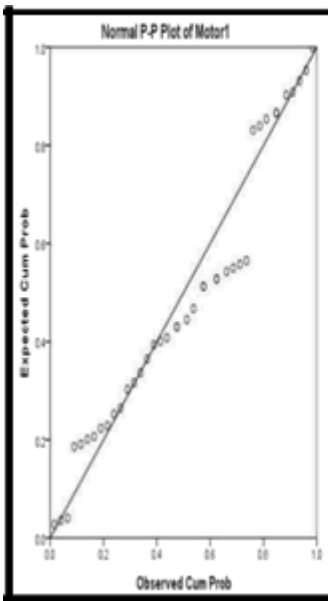
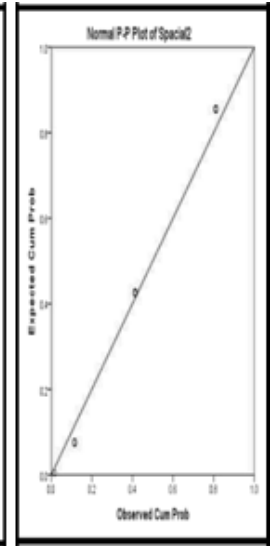
Descriptive Statistics					
	N	Mean	Std. Deviation	Skewness	Kurtosis
Spacial1	40	6.65	1.74753	-0.067	-1.073
Vebral1	40	5.825	1.82416	0.513	-0.177
PLD1	40	0.3951	0.09126	-0.067	-0.335
Motor1	40	4.4933	0.52981	0.626	1.051
Spacial 2	40	9.15	0.80224	-0.598	-0.252
Verbal 2	40	9.075	0.79703	-0.458	-0.374
PLD2	40	0.3954	0.06602	0.224	-0.455
Motor2	40	3.88	0.37416	0.045	1.091
Valid N (listwise)	40				



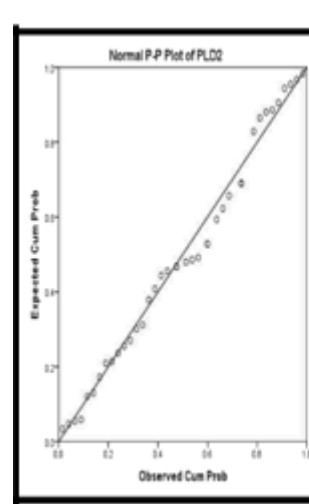
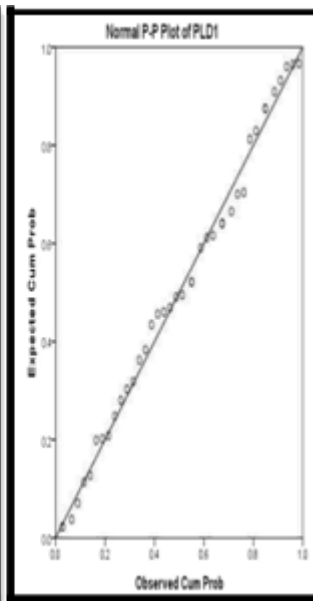
**Figure 1**  
**Figure 1:** Normal P-P Plot of Spatial 1  
**Figure 2:** Normal P-P Plot of Verbal 1



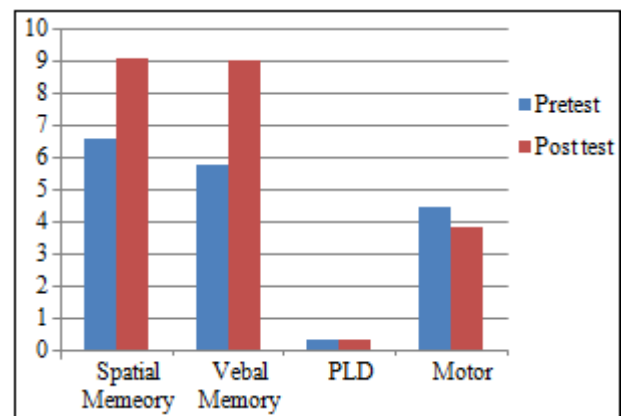
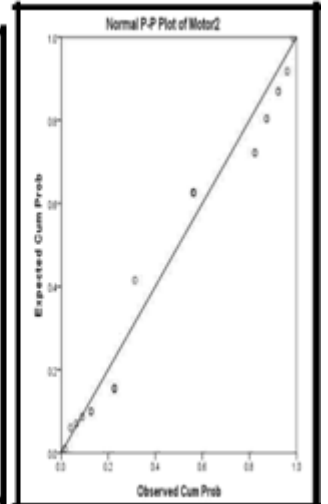
**Figure 5**  
**Figure 5:** Normal P-P Plot of Verbal 2  
**Figure 6:** Normal P Plot of Spatial 2



**Figure 3**  
**Figure 3:** Normal P-P Plot of PLD1  
**Figure 4:** Normal P-P Plot of Motor 1



**Figure 7**  
**Figure 7:** Normal P-P Plot of PLD 2  
**Figure 8:** Normal P-P Plot of Motor 2



**Graph 9:** Mean Scores of Pre Test and Post Test for Different Variables

## Hypotheses testing

**Table 2:** Result of Comparison of Pre-tests and post-tests scores

Variables	Pre-test			Post - test			T value	P value
	N	Mean	SD	N	Mean	SD		
Spatial Memory	40	6.6500	1.74753	40	9.1500	0.80224	9.682**	0.000
Verbal Memory	40	5.8250	1.82416	40	9.0750	0.79703	11.645**	0.000
PLD	40	0.3951	0.09126	40	0.3954	0.01044	.025	.980
Motor	40	4.4933	0.52981	40	3.8800	0.37416	9.760**	0.000

\*\* Significant at 0.01 level

Table 2. Gives the results of the t test performed to compare of mean scores of pre-test and post test scores of different variables under study. With respect the spatial memory the mean pre-test score is 6.65 with a standard deviation of 1.74753. While the mean score of post-test is 9.15 with a standard deviation of 0.80224. There is an increase of 3.5 in the mean score post test conducted after the experiment. The calculated value of t is 9.682 which is statistically significant at 0.01 level ( $t=9.682$ ,  $p > 0.001$ ). Hence, the hypothesis that the 'OM' chanting has a significant impact on the spatial memory of people having type D personality H2 has been accepted.

With respect the verbal memory the mean pre-test score is 5.82 with a standard deviation of 1.82416. While the mean score of post-test is 9.15 with a standard deviation of 0.79703. There is an increase of 3.25 in the mean score post test conducted after the experiment. The calculated value of t is 11.645 which is statistically significant at 0.01 level ( $t=9.11.645$ ,  $p > 0.001$ ). Hence, the hypothesis that the 'OM' chanting has a significant impact on the verbal memory of people having type D personality H3 has been accepted.

With respect the PLD the mean pre-test score is 0.39 with a standard deviation of 0.09126. While the mean score of post-test is 0.39 with a standard deviation of 0.01044. There is a difference of 0.0003 in the mean score post test conducted after the experiment. The calculated value of t is .025 which is statistically not significant at 0.01 level ( $t=.025$ ,  $p > 0.001$ ). Hence, the hypothesis that the 'OM' chanting has a significant impact on the PLD of people having type D personality H4 has been rejected.

With respect the motor skill the mean pre-test score is 4.49 with a standard deviation of 0.52981. While the mean score of post-test is 3.88 with a standard deviation of 0.37416. There is a decrease of 0.61 in the mean score post test conducted after the experiment. The calculated value of t is 9.760 which is statistically significant at 0.01 level ( $t=9.760$ ,  $p > 0.001$ ). Hence, the hypothesis that the 'OM' chanting has a significant impact on the motor skill of people having type D personality H1 has been accepted.

## 5. Discussion

**Table 2**

Gives the results of the t test performed to compare of mean scores of pre-test and post test scores of different variables

under study. With respect the spatial memory the mean pre-test score is 6.65 with a standard deviation of 1.74753. While the mean score of post-test is 9.15 with a standard deviation of 0.80224. There is an increase of 3.5 in the mean score post test conducted after the experiment. The calculated value of t is 9.682 which is statistically significant at 0.01 level ( $t=9.682$ ,  $p > 0.001$ ). Hence, the hypothesis that the 'OM' chanting has a significant impact on the spatial memory of people having type D personality H2 has been accepted.

With respect the verbal memory the mean pre-test score is 5.82 with a standard deviation of 1.82416. While the mean score of post-test is 9.15 with a standard deviation of 0.79703. There is an increase of 3.25 in the mean score post test conducted after the experiment. The calculated value of t is 11.645 which is statistically significant at 0.01 level ( $t=9.11.645$ ,  $p > 0.001$ ). Hence, the hypothesis that the 'OM' chanting has a significant impact on the verbal memory of people having type D personality H3 has been accepted.

With respect the PLD the mean pre-test score is 0.39 with a standard deviation of 0.09126. While the mean score of post-test is 0.39 with a standard deviation of 0.01044. There is a difference of 0.0003 in the mean score post test conducted after the experiment. The calculated value of t is .025 which is statistically not significant at 0.01 level ( $t=.025$ ,  $p > 0.001$ ). Hence, the hypothesis that the 'OM' chanting has a significant impact on the PLD of people having type D personality H4 has been rejected.

With respect the motor skill the mean pre-test score is 4.49 with a standard deviation of 0.52981. While the mean score of post-test is 3.88 with a standard deviation of 0.37416. There is a decrease of 0.61 in the mean score post test conducted after the experiment.

The calculated value of t is 9.760 which is statistically significant at 0.01 level ( $t=9.760$ ,  $p > 0.001$ ). Hence, the hypothesis that the 'OM' chanting has a significant impact on the motor skill of people having type D personality H1 has been accepted.

## 6. Conclusion

Our study provides evidence for beneficial effects of 'OM' chanting on spatial and verbal memory, motor skills and PLD ratio in young adults with type D personality. As scientific evidence regarding the effects of OM chanting are sparse, our study is a stepping stone towards providing the beneficial effects of 'OM' chanting in young adults with type D personality. The present study is intended to provide further evidence for beneficial effects of OM chanting on spatial and verbal memory, motor skills and PLD ratio in young adults with type D personality. And the result of the study were statistically significant. {Graph:9}

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Participants during 'OM' chanting session with author, guide and co- guide



Participants during 'OM' chanting session with author, guide and co- guide

