Scientific Journal of Impact Factor (SJIF): 4.72

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 4, Issue 7, July -2017

Effect of chanting OMKARA mantra on pulse rate for stress reduction

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Abstract — *Today we are heading toward materialistic progress at the cost of our health, physical as well as mental. In this blind pursuit, instead of peace we end up in stressed life in most of the times. Unfortunately neither we understand that we are under stress nor get any training of stress management while we study or work. Consulting psychiatrist is still a taboo in India. Stress creates adverse effect on physical as well as mental health. Our first reaction to stressful situation is rapid pulse rate. Short term stress is easy to control. But long term stress may lead us to mental illness like anxiety, depression, breathlessness, sleep disorders, eating disorders etc. So it is very important that we use techniques to lessen the adverse effect of stress at right time. Studies have shown that techniques like meditat1ion, mantra therapy, music therapy or Raga therapy can help us in this matter. From ancient times yogis and saints of India were using mantra therapy for maintenance and improvement of mental, physical as well as spiritual health. Today's researchers have also done experiments to show that mantra therapy can be used to regulate human reactions like stress, anxiety, fear etc. This paper is an attempt to present positive effects of chanting OMKARA on pulse rate to calm our mind. In order to investigate effect of chanting OMKARA, twenty healthy volunteers were chosen for this experiment. In this experiment the participants were asked to chant OMKARA for five minutes daily for four weeks. Their pulse rate was recorded before and after chanting. The results show reduction of pulse rate of the participants in post chanting measurement.*

Keywords- *OMKARA, meditation, stress management, Cortisol, PSD*

I. INTRODUCTION

Stress is treated as negative feeling, but stress experienced while playing sports, delivering public speeches, appearing for exams or interviews is not bad. Such stress can improve our performance and is considered as short term stress. Our body can handle short term stress quiet well. But now a day's long term stress is being experienced by people of all the age groups; teenagers, adults or old aged. Some of the symptoms of stress are overwork, frequent heated arguments, isolation, insufficient sleep, excess guilt feeling of past deeds, introspective about the fault etc [1].

When we encounter any stressful situation our body react in following way – Our brain sends the signal to adrenal glands telling to release the adrenaline hormones, which increases amount of sugar in blood. Our heart starts beating faster and blood pressure increases. We breathe faster and pump more oxygen inside so that energy rich blood is supplied to muscles to take necessary action. Brian also sends the signal to pituitary glands at the bottom of the brain to release stress hormones called Cortisol. Cortisol is very important for stress management. Raised level of Cortisol have very adverse effects on human body such as - anxiety, depression, breathlessness, sleep disorders, eating disorders, weak immune system, loss of memory, loss of decision taking capacity, imbalance of emotional reactions, reluctance to learn new things etc. In worst case, brain size can shrink or synaptic connections responsible for memory can be damaged permanently. Fortunately we are born with self healing power. If we detect the stress symptoms at early stage, we can take necessary actions to control it. Studies have suggested some of the techniques of stress management like exercise, pranayam, yoga, meditation, mantra therapy, music therapy, raga therapy etc [2].

In recent past, Positive effect of mediation on four emotions of happiness, anger, sadness and relaxation is studied in [3]. The relationship between chanting name of Lord Vitthal on physiologic and energy profile of Heart is presented in [4]. The role of mantra in mental health is deeply explained in [5]. Further positive effects of Mahamrutyunjaya mantra on plants like Rose, Tulsi is elaborately investigated in [6]. Raga therapy to cure diseases is presented in [7].

This paper is an attempt to investigate effect of mantra therapy for stress management. The purpose of this study is to analyse the effects of chanting OMKARA on the pulse rate; pre and post measurement of pulse rate. Three types of meditation practices are available: focused attention, open monitoring, and positive affect training [8, 9]. In this study focused attention meditation style is used; where the subjects focus their attention on sound of OMKARA and breathing too. When the participant is chanting OMKARA, he/she was instructed to closes his eyes to reduce distraction, sit erect on the chair or in sukhasana (leg crossed) and concentrate on sound of OMKARA. To record the pulse rate, pulse rate measuring kit based on IR sensor and PIC16F628A was designed and used. For each of the participant, this experiment was conducted for one month in participant's homes at different times of the day as per there availability. Positive results started coming after about 10 days, when participants started responding well.

II. STUDY DESIGN, TARGET POPULATION

The purpose of this study is to analyze the effects of chanting OMKARA on the pulse rate. The proposed experimental study is conducted on healthy volunteers after checking their basic medical conditions. In order to conduct this experiment 20 volunteers were chosen in the age group of 20 to 50. The consent form was willingly signed by all the volunteers for said experiment. All the volunteers were provided with detailed information about the experiment undergoing. The data about personal profiles of participants, which includes age, gender, physical condition, medical conditions have been collected before. During the experiment the subjects were instructed to a) sit comfortably on the chair or ground with erect spine b) close their eyes to reduce distraction and c) concentrate on chanting for five minutes. The Pulse rate was recorded twice for each participant, before and after chanting OMKARA for 5 minutes. Thus total seven minutes were spent for each participant.

III. WHY OMKARA MANTRA?

In paper [10], the author has done the frequency analysis of OMKARA mantra. The author has inferred that PSD of OMKARA shows the presence of all the frequencies in the audio band similar to Gaussian White Noise. This property of OMKARA mantra is unique. Thus the power of focused OMKARA chanting helps us to calm our mind by blocking other sounds entering our mind. This is the reason OMKARA mantra is chosen in this study to analyse its effect on the pulse rate. The PSDs of Gaussian White noise and Chanting of OMKARA by male and female participants are shown below [11].

As shown in figure 1, 2 and 3, energy of OMKARA chanting is present over all the frequencies of audio band similar to Gaussian white noise. This is the reason, focused chanting of OMKARA can remove unwanted thoughts from the mind and make mind calm. As our focus is shifted from the stressful thoughts, adverse effect on heart rate is minimized which result in reduced pulse rate which is one of the symptoms of stress. Further, frequency modulated signal of chanting of OMKARA by male and female participants are shown below in figure 4 and 5.

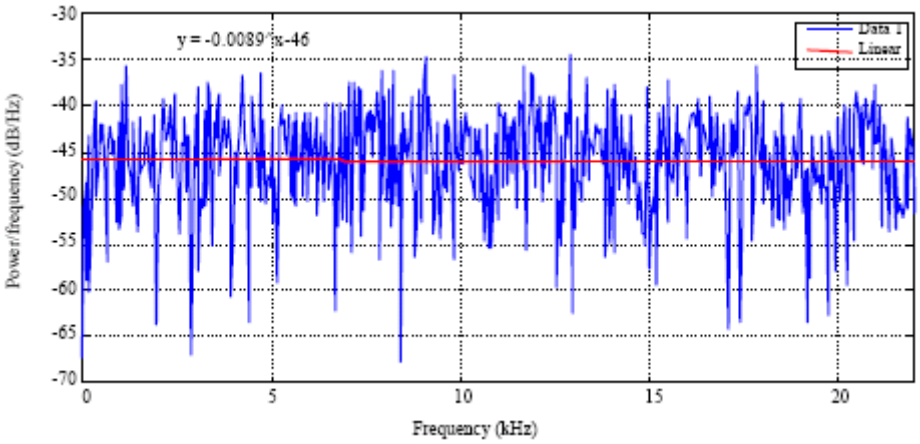

Fig. 1 PSD of Gaussian white noise with slope of -0.0089 for linear fitting

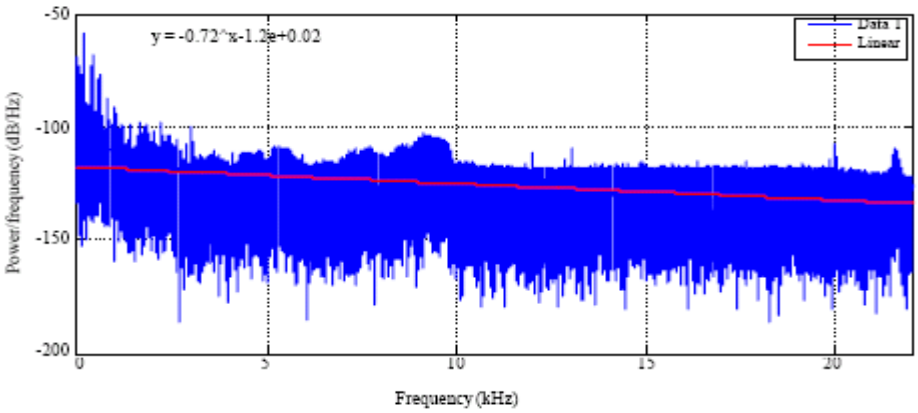

Fig 2. PSD of OMKARA chanting by female participant with slope of 0.72 for linear fitting

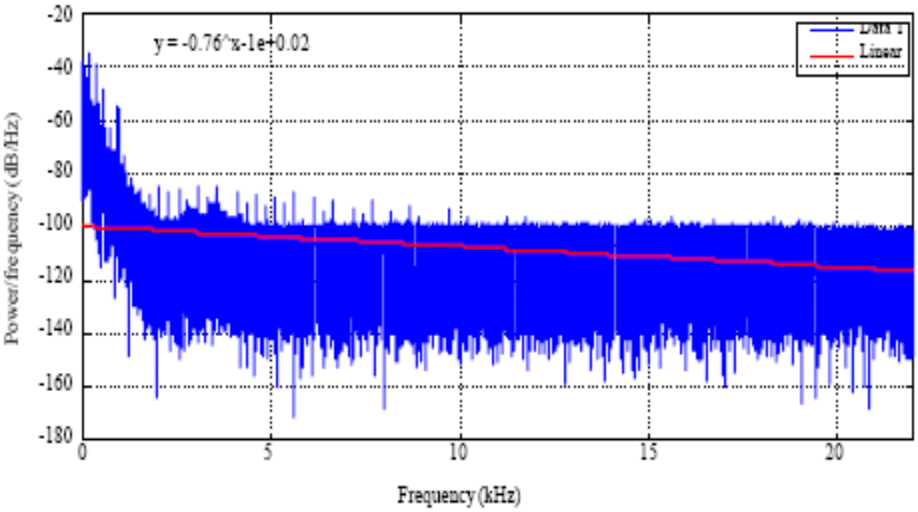

Fig 3. PSD of OMKARA chanting by male participant with slope of 0.76 for linear fitting

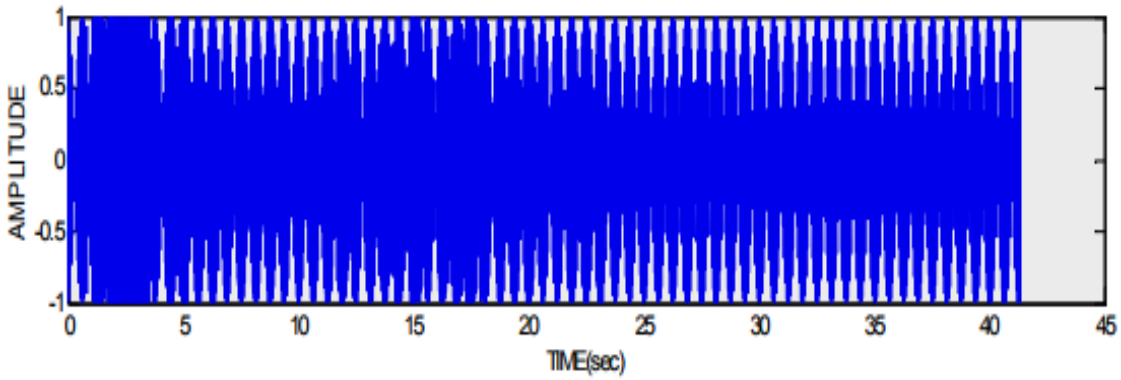

Fig 4. The frequency modulated signal of OMKARA by a male speaker

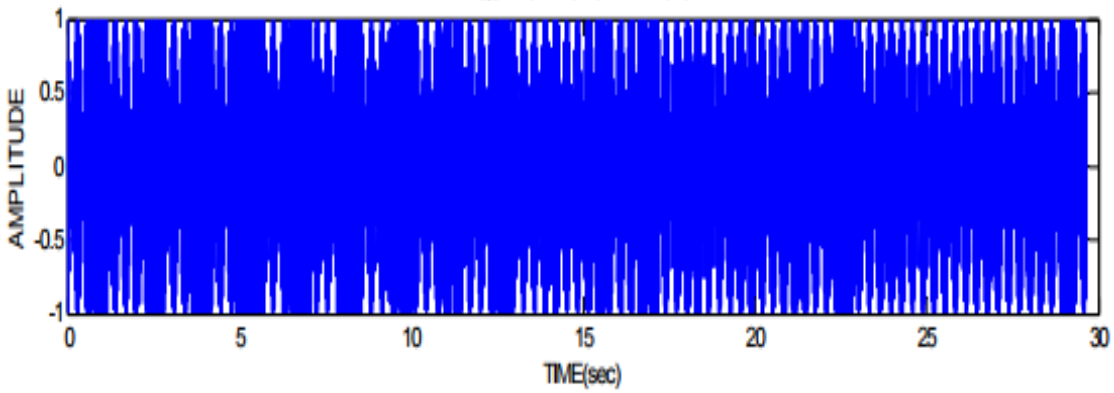

Fig 5. The frequency modulated signal of OMKARA by a female speaker

I. EXPERIMENTAL SETUP FOR PULSE RATE MEASUREMENT

Pulse rate of the heart is the number of heartbeats per unit of time and is usually expressed in beats per minute (bpm). Pulse rate of 60 to 100 is normal for adults. The pulse rate is measured on wrist or neck where we can sense them with figures. Ayurvedic doctors can diagnose the patients just by sensing the pulse rhythm.

In our case, the pulse rate is measured by sensing the variation of the blood volume inside a finger artery, which is caused by the pumping action of the heart. To sense the flow of blood volume at fingertip with each heart beat, IR LED and photodiode is used. They are placed adjacent to each other on the board. The transmitted infrared light by IR LED is reflected from the fingers and received by photodiode. The intensity of reflected light depends upon the blood volume

inside the fingertip. Using signal conditioning circuit, this amplitude change of reflected light can be converted into a train of pulse. These pulses will be counted by microcontroller. The microcontroller used is PIC16F628A [12] with 4 MHz external crystal and power supply of +5V. Number of pulses counted in one minute will give us pulse rate. The magnitude of reflected wave is amplified and filtered using dual stage active high pass filter. The OPAMP used is MCP602, manufactured by Microchip. Some of the features of MCP602 are [13] - Single-Supply: 2.7V to 6.0V, Gain Bandwidth Product: 2.8 MHz (typical), Unity-Gain Stable, Low Quiescent Current: 230 µA/amplifier (typical), Temperature Ranges: - Industrial: -40°C to +85°C - Extended: -40°C to +125°C.
MCP602 are used as active low pass filters for following cut off frequency and gain-
Cut off frequency = $1 / 2\prod R_f C_f = 1 / 2\prod$* 680K *100nF = 2.34 Hz

Gain of each stage of OPAMP is $1 + (R_f / R_i) = 1 + (680K / 6.8K) = 101$
They are cascaded to obtain the gain of 101*101= 10201.

The high frequency noise of the signal is removed by cascaded low pass filters. The DC components of signal are removed using 1 uF capacitor at the input of each stage. The output of OPAMP is given to Timer 0 clock input. PB0 to PB6 pins of PORTB are used to drive seven segment of the display. PA0, PA1 and PA2 of PORTA are used to multiplex the unit's, ten's and hundred's digits. The counting of the pulse rate starts when the tact switch connected to PB7 is pressed. When the tact switch is pressed, IR transmission begins for 15 seconds and pulses arrived at Timer are counted. Then the count is multiplied by 4 to obtain the pulse rate in bits per minutes. The pulse rate is displayed on three digit seven segment display with common anode.

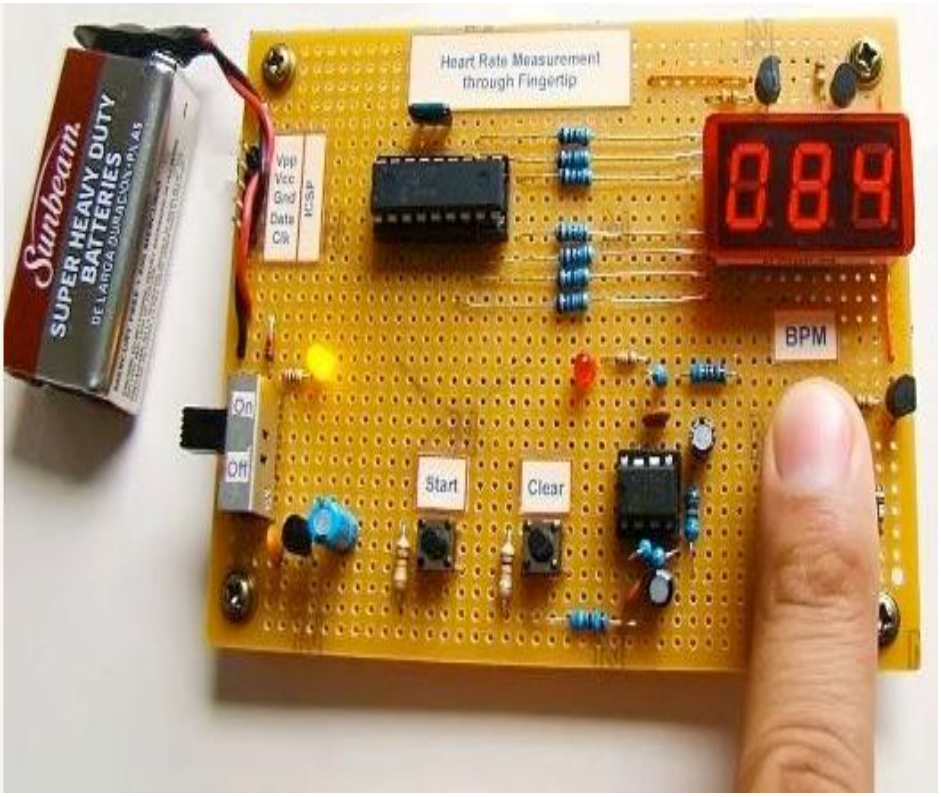

Fig 6. Pulse rate measurement board

II. RESULT AND DISCUSSION

The chanting experiment was conducted on 20 healthy volunteers, 10 male and 10 female. The volunteers were chosen after checking their basic medical conditions. Pregnant ladies, Blood pressure patients were avoided for the experiment. Age group of participants is between 20 to 50 years. Distribution of participants is like this - seven are between 20 to 30 years, seven are between 31 to 40 years and six are between 41 to 50 years. The consent form was willingly signed by all the volunteers for said experiment. All the volunteers were provided with detailed information about the experiment undergoing. The data about personal profiles of participants, which includes age, gender, physical condition, medical conditions have been collected. Pulse rate was recorded twice for each subject, before and after chanting OMKARA for 5 minutes. During the experiment the subjects were instructed to a) sit comfortably on the chair or ground with erect spine b) close their eyes to reduce distraction and c) concentrate on chanting for five minutes. The pulse rate was recorded pre and post chanting. Thus total seven minutes were spent for each subject.

The experimental results are shown in table 1. The pulse rate recording was done for four weeks regularly in participant's homes at their leisure time. Pulse rate was recorded before chanting and after five minute chanting of OMKARA using the above mentioned board. Their mean value is presented in the table. The reduced pulse rate was observed after about ten days, when participant's concentration on the chanting improved. The reduction in pulse rate as a result of chanting ranges from 3 to 8 bits per minute for different participants.

Table - I Pulse rate measurement record of 20 participants before and after OMAKRA chanting

Sr. NO	Name	Age	Gender	Physical Condition	Medical Condition	Pulse rate Mean (bpm) before chanting (PRb)	Pulse Rate Mean (bpm) after chanting (Pra)	Difference between pulse rate before and after chanting PRb – Pra
1	Amarnath Kori	45	M	Early Morning Workout	Vertigo	69	63	6
2	Krishna Kori	20	F	None	None	79	74	5
3	Gayatri Warrier	23	F	Walking	None	88	80	8
4	Shrikant Warrier	25	M	None	Asthma	84	78	6
5	Kumari Warrier	45	F	None	None	87	82	5
6	Chadrashekhar Warrier	50	M	None	None	86	80	6
7	Rupali Makwana	47	F	None	None	92	87	5
8	Mahesh Sawant	30	M	Gym workout (evening)	Cholesterol	98	91	7
9	Priti Sawant	35	F	None	None	93	87	6
10	Chhaya Sawant	40	F	None	Mild Asthma	80	77	3
11	Smitha Sawant	25	F	None	None	87	82	5
12	Smruti Belwalkar	37	F	none	None	82	75	7
13	Leena Govekar	42	F	None	None	91	85	6
14	Vijay Govekar	47	M	None	None	97	93	4
15	Priti Tyagi	40	F	None	None	100	95	5
16	Dhaval Parmar	35	M	None	None	90	85	5
17	Ankit Parmar	25	M	None	None	93	88	5
18	Yash Parmar	30	M	yoga (morning)	None	79	73	6
19	Jignesh Shah	40	M	None	None	87	81	6
20	Ramesh Ojha	32	M	None	None	77	72	5

III. CONCLUSION

One of the symptoms of stress is rapid pulse rate. In this study, the experiments have conducted to show that focused chanting of OMKARA for five minutes daily can be used to reduce pulse rate. When we repeat chanting OMKARA while eyes closed with full concentration on sound, we experience the effect of mediation where our mind becomes calm, breathing is slow, worldly thoughts disappear and pulse rate reduces. This is positive sign of stress reduction which was observed in all the participants. This shows that mantra meditation is also one of the powerful tools for stress management. In future, effect analysis of mantra meditation on human brain can be investigated. Also the power of other Sanskrit mantras and shlokas on human body and mind can also be investigated. Here the author is not advocating disapproval of importance of psychiatrist consultations. Instead we are suggesting that it is better to take control of stress instead of letting stress control us.

IV. REFERENCES

[1] www.youramazingbrain.org/ stress and the brain
[2] https://ed.ted.com/How stress changes the brain
[3] Narendra Jadhav, Ramchandra Manthalkar, Yashwant Joshi, "Effect of meditation on emotional response: An EEG-based study", Elsevier , Biomedical Signal Processing and control 34, 101-113, 2017.
[4] Prasad Joshi, Avinash Imandar, Sanjivani Inamdar, Ravi Prayag, Jyuthica Laghate, Bhagyashree Nilkanth, "Effect of chanting 'Vitthal' on Heart: A Clinical Study", Asian Journal of Complementary and Alternative Medicine, 11-15, 2014, ISSN: 2345-3894
[5] Dr. Balaji Deekshitulu P. V, "Role of Mantras in Mental Health", International Journal of Humanities and Social Science Studies, A Peer Reviewed Bi- monthly Bi-lingual Research Journal, Volume I, Issue VI, Page No. 34-39, May 2015, ISSN: 2349-6711.
[6] Jayant K. Kshirsagar, Vaishali Ekbote, "Effects of Vedic mantras on plants", Journal of Basic Sciences, Special Issue on BioIPPF, 62-65, 2014.
[7] Joyanta Sarkar, Utpal Biswas, "Indian classical ragas to cure diseases", Volume 1, Issue 1, Page No. 09-13, January 2015, ISSN: 2455-4227
[8] Matthieu Ricard, Antoine Lutz, Richard J. Davidson, Mind of the meditator, Sci. Am. 311 (5) (2014) 38–45.
[9] W. John Thomas, Marc Cohen, A methodological review of meditation research, Front. Psychiatry, 2014.
[10] Ajay Anil Gurjar , Siddharth A. Ladhake, Ajay P. Thakare , "Analysis Of Acoustic of "OM" Chant To Study Its Effect on Nervous System", IJCSNS International Journal of Computer Science and Network Security, VOL.9 No.1 , January 2009
[11] Ajay Anil Gurjar , Siddharth A. Ladhake, "Analusis and Dissection of Sanskrit Divine Sound "OM" using Digital Signal Preocessing to study thescience behind "OM" chanting, IEEE International Conference on Intelligent Systems, Modelling and Simulation, 2016, 169-172, DOI 10.1109/ISMS.2016.79
[12] www.microchip.com/datasheet/ PIC16F628A
[13] www.microchip.com/datasheet/MCP602

