

EFFECTIVENESS OF MANTRAS AS STRESS BUSTER - A REVIEW

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ABSTRACT

Meditation has served as a traditional technique to transform consciousness and gain higher insight by focusing attention and introspectively observing one's own mental process. The Concentrative, Mindfulness meditation techniques are been practiced by the people. A mantra is a short, fixed word or phrase that can be defined as a powerful spiritual formula for the highest power we can conceive of whether we call it God, or ultimate reality, or self within. Mantras are ancient and found in both West and East. The practicing of silent repetition of mantras has been applied in our modern day living as innovative form of stress management. Mantra repetition involves frequent repetition throughout the day and night. To experience maximal benefit, mantra should be repeated silently everyday: while walking, waiting or falling in asleep etc.. Meditation is often considered to be an alternative and complementary medicine which can be used to treat peoples with stress-related mental and physical disorders. In this paper we review some of the studies conducted on effectiveness of mantras as stress buster.

Keywords: Meditation, Mantra, alternative medicine, Stress, EEG

I. INTRODUCTION

Many people use various meditation techniques to cope up with stress in their day to day life. Various types of mantra repetition are found in nearly every major religious and spiritual tradition. The Mantra repetition is personal, private, invisible, inexpensive, nontoxic and portable. The main features of mantra are to disrupt negative thought and behaviors by rechanneling the focus of attention and behavior. Meditation is often considered to be an alternative and complementary medicine which can be used to treat peoples with stress-related mental and physical disorders. The therapeutic significance of meditation in relation to these disorders needs to be carefully examined. Also the suitability of a person for meditation practice, the amount of practice (dosage), and customized meditation techniques should be determined based on careful studies. Hence studies related to people populations, which use similar paradigms or variations on this paradigm comparing different types of meditation practice, will facilitate the determination of the therapeutic value of meditation.

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Alternative and complementary medicine has carved a niche for itself in the health care system of countries for a variety of reasons. Its cost-effectiveness, its ability to provide solutions to some challenges not possible by western biomedicine, such as integrating care of the mind, body and emotions of an individual, and its ease of administration have made alternative and complementary medicine increasingly popular.

Concentrative and mindfulness meditations techniques are widely used in different parts of the world today. They are using different techniques for meditation. The first category contains three subtypes.

i) Transcendental Meditation(TM) - A 20-to-30 minute practice usually done twice daily, in which the mediator focuses on a specific word image or sound (Mantra).

ii) YOGA Meditation-originally derived from ancient Hindu culture, various types exists. Each type utilizes its own techniques in body posture.

iii) Meditative Prayer- A form of religious contemplation seen in Christianity, Judaism, Islam wherein a devout practitioner focuses their attention on a certain phrase or prayer from their religious text with goal of opening themselves to ,attaining oneness, with a certain divine entity.

The second category consists two sub types. They are

i) Zen Meditation- Originally derives from the Mahayana school of Buddhism found in Chinese, Japanese ,Korean Culture. The practitioner's goal is to enter satori, a state of enlightenment in which they fully attuned to the reality

both inside and outside their body, and they gain ability to ask appropriate questions concerning their abilities.

ii) Vipassana Meditation- A practice derived from the Thervada Buddhist tradition of Thai Burmese Culture, wherein practitioner passively observes their present thoughts and bodily sensations with goal of increasing equanimity , a state of passive acceptance their relies on awareness of these thoughts and sensations.

Though meditation, or the practice of focusing and relaxing the mind, has been traditionally considered an integral activity in various religious traditions, recent research has suggested that it is helpful in improving emotional well-being and reducing stress and thus meditation is now a widely practiced psychological intervention used in clinical settings for generating relaxation responses. Various types of meditation, including concentrative meditation and mindfulness meditation, have been successfully employed in patient populations suffering from a variety of diseases related to or modulated by stress levels. Hypertension, alcohol intake, substance abuse, psoriasis and headaches are some disorders where mindfulness meditation has shown beneficial effects. In this paper we review some of the studies related to mantra meditation using electroencephalography (EEG).

II. STRESS

Stress is a normal physical response to events that make us feel threatened or upset our balance in some way. When we sense danger – whether it's real or imagined – the body's defences kick into high gear in a rapid, automatic

process known as the fight-or-flight reaction, or the stress response. The stress response is the body's way of protecting us. When working properly, it helps us to stay focused, energetic, and alert. Stress affects the mind, body, and behaviour in many ways, and everyone experiences stress differently. There are number of studies that give information on stress related problems which will cause positive effect. They are heart disease, asthma, Obesity, diabetes, headaches, depression and anxiety, gastrointestinal problems, Alzheimer's disease, accelerated aging, premature death etc.

There are number of scientifically proven methods to reduce stress like spark some scents, listen to music, breathe deep, try guided visualization, meditate and try self-hypnosis.

The different techniques used in meditation studies are
 1) Functional Magnetic Resonance Imaging (fMRI) provides ongoing impressions of working brain functions in relation to behaviour. The technique used is blood oxygen level dependent.

2) Positron Emission Tomography (PET), in this technique, a person is intravenously injected with a liquid that contains weak radioactive isotope. Using its properties and positrons emission the studies are conducted.

3) Single Photon Emission Computed Tomography (SPECT). This scan is nearly as same as PET scan, except that instead of X-rays the scanner detects the individual photons that emitted by different kind of tracer.

4) Brain Waves- In additions to the imaging techniques it is possible to study the meditating brain by monitoring electrical activity.

III. EEG

The electrical activity of the billions of neurons found in the brain produces a continuous stream of electric waves that are emitted from the cerebral cortex. These brain waves as they are called can be observed and recorded using a device called as Electroencephalograph (EEG). Brain signals are to be acquired using non invasive EEG electrodes which are placed on the scalp of the subject as per the 10-20 International Standard. This is given in Figure1.

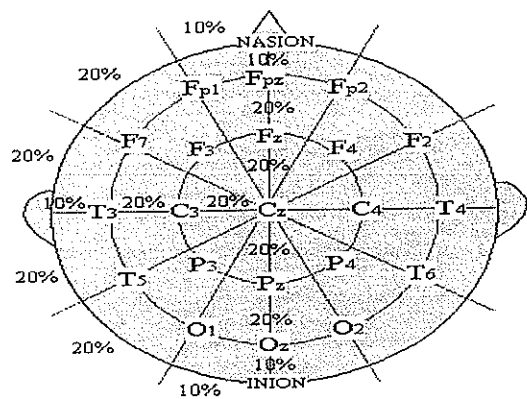


Figure 1 : 10-20 Electrode Placement System

There are five types of brain waves that are distinguished by their frequency, measured in cycles per second, Hertz(Hz). Delta waves (1-3 Hz) have slowest wave cycles, and commonly appear when we are in a deep sleep. Theta waves (4-7 Hz) can also be present during sleep, usually when we start to feel drowsy and fall into a light sleep. Alpha waves (8-12 Hz) are typically present during a state of relaxed awareness when our minds are not actively engaged in deep thought. Beta waves (13 -29 Hz) appear when we are actively thinging, alert and attentive).Gamma waves(30-80 Hz) have fastest wave cycles, and often arise when we are mentally integrating and processing complex sensory information. The representation of various brain signals as are given in Figure 2.

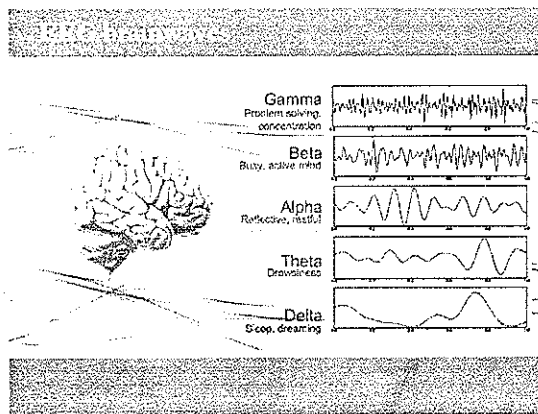


Figure 2 : Various Brain Signals

IV. MANTRA STUDIES USING EEG

Some of the studies on stress analysis using mantra meditation is discusses here. In a study conducted by Benson,et al [1] They report that the meditation and stress management technique for relaxation enhancement

in practicing certain meditation techniques, including types of concentrative meditation and, mindfulness meditation, such as TM or Zen meditation can produce a decrease in muscle tone, respiratory rate and heart rate of the practitioner. Shapiro [2] Defined meditation as a family of techniques which have in common a conscious attempt to focus attention in a non-analytical way, and an attempt not to dwell on discursive, ruminating thought.

As we know the meditation can bring about a change in the level of consciousness, awareness. The relationship of meditation and consciousness has been of interest. Then the consciousness is defined as the neural activity underlying the state of waking awareness. Meditation is considered as a psychologically induced altered state of consciousness [3]. Meditation has thus been defined as an ancient technique which aims to gain a degree of control over various autonomous psychobiological processes [4].

Changes in states of consciousness associated with meditation have been measured through EEG measures, fMRI and other measures of brain activity. The state of consciousness associated with meditation can be voluntarily practiced and can be modified with training. Mental faculties like cognition and attention can be trained regulated with meditation. Thus meditation has also been defined as a, group of practices that self regulate the body and mind, thereby affecting mental events by engaging a specific attentional set [5]. Takahashi et al. also endorse a similar view, using the definition; meditation is an attainment of a restful yet fully alert physical and mental state practiced by many, as a self regulatory approach to emotion management [6].

Meditation has been defined as a mental training that brings about long term changes or trait changes in cognition and emotion [7]. A definition of meditation put forth by [8] Lutz et al. is comprehensive and can be applied to different meditative techniques. Cardoso et al, argue that meditation practices use a definite technique involving self-focus skills. Meditation is a self induced practice that produces both-muscle relaxation and logic relaxation [9]. The various study findings suggest that Yoga and various forms of mindfulness meditation may provide supplemental benefit for the treatment of stress ,mood, anxiety symptoms [10-12].

The review conducted by Bryan Williams, [13]. to investigate about what goes inside the brain during the various forms of meditation based on the experimental findings. In his study he argued that the TM can give a calming effect in their body while they are meditating. Various EEG studies indicate that when somebody chanting mantra, they show a study pattern of alpha waves. This suggests that brain waves of TM practitioners will give a frequency associated with low mental arousal. In his study he found that TM practitioners may produce patterns of synchronised brain waves, known as EEG Coherence. EEG and imaging studies examine the brain's activities during different types of : meditation Tantric, Kundalini, Sahaja, Nidra, Iyengar. During the study the brain signal are taken from novice and advanced mediators. It is found that there are some positive

correlation to stress and yoga. The author also studied several forms of meditative prayer which are seen across several different religions. The study was done using spectral analysis. Then the blood flow of various regions of brain are analysed. The Zen meditation of type mindfulness meditation shows that during the mediation a novice is found to produce a study pattern of alpha waves. The above experimental findings revealed that the meditative state may induce short term changes in brain activity. As one enters in a meditative state brain wave activity begins to slow and ease into frequencies in the alpha and theta range, frequencies commonly associated with relaxation and low arousal.

The review conducted by Jill E Bormann, [14]. to investigate about in his study of frequent, silent mantra repetition he suggest that frequent, silent mantra repetition is unique because it can be practical anytime, anywhere, even while on the job during stressful movements. It helps focus attention, slows down the thinking process, and allows pause time for decision making. Unlike other stress management technique it has added potentiality to deepen one's spirituality. He suggested that we should take much care while choosing mantra. Avoid words that may evoke negative association or bad memories. The various religious mantras that could be practiced are given in Table 1.

Table 1 : List of common mantras

Mantras	Meaning
Buddhist	
Om Mane Padme Hum (Ohm mah-nee pod-may-hume)	An invocation to the jewel (Self) in the lotus of the heart
Namo Butsaya (Nah-mo boot-sie-yah)	I bow to the Buddha
Christian	
My God and My All	St. Francis of Assisi's mantra
Maranatha (Mar-uh-naw-tha)	Lord of the Heart (Aramaic)
Kyrie Eleison (Kir-ee-ay Ee-lay-ee-sonc)	Lord have mercy or the Lord is risen
Christe Eleison (Kreest-ay Ee-lay-ee-sonc)	Christ have mercy, Christ has risen
Jesus, Jesus or Lord Jesus Christ	Jesus Christ
Hail Mary or Ave Maria	Mary mother of Jesus
Hindu/Indian	
Rama (Rah-mah)	Eternal joy within
Ram Ram Sri Ram (rahm rahm shree rahm)	Gandhi's mantra (variation on Rama)
Om Namah Shivaya	An invocation to beauty and fearlessness
Om Prema (Ohm Pray-Mah)	A call for universal love
Om Shanti (Ohm Shawn-tee)	An invocation to eternal peace
So Hum (So hum)	I am that Self within
Jewish	
Barukh Atah Adonoi (Bah-ruke Ah-tah Ah-don-aye)	Blessed are Thou O Lord
Ribono Shel Olam (Ree-boh-noh Shel Oh-lahm)	Lord of the Universe
Shalom	Peace
Sheheena (Sha Hee-nah)	Feminine aspect of God
Muslim	
Allah	God
Bismallah Ir-rahman Ir-rahim (Beese-mah-lah ir-rah-mun ir-rah-heem)	In the name of Allah, the merciful, the compassionate

In the review paper by B. Rael Cahn, John Polich [15] on meditation states and traits: EEG, ERP, and Neuroimaging Studies they thoroughly reviewed the meditation and traits. Measurement of the brain response to meditative practice is based on the premise that different conscious states are accompanied by different neuro physiological states and on reports that meditation practice induces distinct states and traits of consciousness. State refers to the altered sensory, cognitive, and self referential awareness that can arise during meditation practice, whereas trait refers to the lasting changes in these dimensions that persist in the meditator irrespective of being actively engaged in meditation. They have analysed Meditation states and traits are being with neuroelectric and other neuroimaging methods. The findings are becoming more cohesive and directed, even though a comprehensive empirical and theoretical foundation is still emerging. Central nervous system function is clearly affected by meditation, but the specific neural changes and differences among practices are far from clear. According the author likelihood for clinical utility of meditation practice in conjunction with psychological and neuropharmacological therapies is a strong impetus for future studies.

The study conducted by HL Dhar [16] to investigate about the meditation as medicine, he suggested that the meditation that deals with specific medical problems can be called as medical meditation. He says it is so specific because it balances and regenerates the body's etherical and physical energies forging an extra ordinary healing alliance. The five unique attributes that endow this types of meditation with tremendous power are special postures and movements, exact positioning of hands and fingers, particular mantras or sounds, specific breathing patterns

and unique focus of concentration. In his study he says the combination of these elements can change your entire profile of endocrine neurotransmitters and hormone secretions easing you into calm, healing, anti-aging state [17-18].

The study conducted by Aditi A Joshi [19] about Effects of Meditation Training on Attentional Networks: A Randomised controlled trial examining psychometric and electrophysiological (EEG) measures, he has used meditation training experiment in which the meditation session was examined both before and after the training. He found that the EEG alpha and theta activity in pre-training shows higher level when subject were in a meditative state compared to an off-focus state. In his study he found that the training will improve the ability of meditation group to reduce mental activity using the EEG analysis.

The research review conducted by Braboszcz, C., Hahusseau, S., Delorme, A. [20] Meditation and Neuroscience: from basic research to clinical practice they tried to understand meditation effects at the physiological, attentional, and affective levels and the scientific paradigms used to study these effects.

In their study they reported that meditation promotes both physical and mental wellbeing and contributes to the development of positive emotional traits [21]. They discussed the importance of integrating its active principles in therapies for patients suffering from physical diseases and mental disorders [22]. Becoming aware of the fluctuating quality of thoughts, sensations, emotions, and other internal phenomena helps to reduce dissociative disorders and the perceptual narrowing that these

disorders induce. They say that, meditation-based interventions such as mindfulness-based stress reduction and mindfulness based cognitive therapy are being used in depression relapse prevention. They say these techniques have can be modified and adapted for the treatment of acute disorders such as chronic pain, depression, fibromyalgia, and psoriasis, as well as anxiety, eating, and psychosomatic disorders. In all cases, results have been encouraging and support its use in therapeutic practices [23]. In the years to come, they hope to see the development and validation of more meditation protocols adapted to specific disorders. They suggest that the wide range of observable effects of attentional training during meditation allows the researchers to study the multiple connections between the mind, brain, and body. Their study say meditation training seems to protect against stress and boosts the immune system.

V. CONCLUSION

Most individuals are affected by stress related problems. Every one of us may be a victim of the stress related problems in their walks of life. Developing assistive measure using the techniques of mantra mediation is vital to help them live more effectively as long as possible. It is essential to explore the capabilities of various mantras for the benefits of human being in the scientific means. Neuroelectric studies of meditations like EEG analysis can be applied. Moreover these religious mantras are highly portable, non-toxic, and inexpensive also. This scientific study may give a clear direction and hope to highly stressed people who are living in this modern world. This research papers are shows that there is good hope for meditation techniques for stress control.

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