

# A Survey on the Effects of Meditation and Mantra Chanting on Brain Functioning

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**Abstract:** *The prevailing systems of education are failing to develop the full brain potential of every student, due to which education is unable to realize its highest goals. We know from experience that when we are distracted, stressed, depressed or anxious we function far less effectively. This is because the regions of the brain that gather and process information are working poorly at such times. It is primarily a problem with attention but we don't have to be stressed to notice that much of the time we are not focused on the things we need to be focused on. Learning mindfulness not only helps us to function better under pressure but also helps us to utilize our time better, to focus, and to foster a growth mindset which is more conducive to learning. The science of Mantra Chanting is based on optimizing the channelization of energy through our being. Regular practice of meditation and mantra chanting is bound to yield wonderful results, irrespective of one's faith or religion.*

**Keywords:** grey - matter density, Mantra, Meditations, mental strength, prefrontal cortex

## 1. Introduction

Meditation is the most scientifically investigated form of subject in which there is a huge growth of interest in clinical and scientific areas in recent years. It is a mental discipline which involves training attention. Due to the regular practice of mediation, one can use the mind in a different way and can focus on the useful things, which helps the particulars to live more consciously and fully. Mediation as well as mantra chanting can be adopted as lifestyle for promoting our physical and mental health. If this is introduced at the school level would help to inculcate healthy habits and healthy lifestyle to achieve good health. Cultivating greater attention, awareness and acceptance through meditation practice is associated with psychological distress, including less anxiety, depression, anger and worry. Thus, it encourages a positive and healthy lifestyle for physical, mental and emotional health of children. It also empowers oneself with increased concentration, memory, calm, peace and contentment at mental level leading to inner and outer harmony.

## 2. Meditation

### 1) Types of Meditations

- Standing Meditation:** Standing meditation is effective in relieving lower back pain and also promotes a sense of internal stability.
- Walking Meditation:** In the Zen tradition, walking meditation is called kinhin. In this type of meditation, one has to move slowly and continuously while staying aware of the body and mind.
- Dance Meditation:** Most people, at one time or another, find the dance meditation effective to cut the stress and chill out after a tough day. Dance or kundalini meditation takes that release one step farther by asking participants to let go off the ego and surrender to the rhythms and ecstasies of movement.

- Daily Life Practice Meditation:** In the Buddhist Zen tradition, daily life practice meditation is called Samu work meditation. In this type of meditation, one has to reduce the speed of daily activities and use the extra time to be mindful and focus on thoughts.
- Breathing Meditation:** In this type of meditation inhaling and exhaling is controlled. It is also called as yogic breathing or Pranayama. Dr. Jeffrey Rubin explains, "Longer exhales tend to be calming, while longer inhales are energizing. For meditative purposes either the ratio of exhale to inhale is even or the exhale is longer than the inhale for a calming effect."
- Concentration meditation:** In the concentrative meditation technique, practitioner focuses on a single point. This may include staring at a candle flame, focusing mind on the breath, repeating a single word or mantra, listening to a repetitive song.
- Mindfulness meditation:** In this meditation technique the practitioner observes wandering thoughts as they drift through the mind. The intention is not to get involved with the thoughts or to judge them, but simply to be aware of each mental note as it arises.
- Transcendental meditation (TM):** This practice centers on the repetition of a mantra, but the primary emphasis is on the absence of concentrative effort and the development of a witnessing, thought - free "transcendental awareness" [1].
  - Other forms:
    - Listening to music
    - Painting, drawing; art
    - Yoga, Tai Chi
    - Breath

### 2) Benefits of Meditation

#### a) Brain and Mind

In a study, Professor Filip Raes concludes that "students who follow an in - class mindfulness program report reduced

indications of depression, anxiety and stress up to six months later. Moreover, these students were less likely to develop pronounced depression - like symptoms. " Also meditation decreases ruminative thinking and dysfunctional beliefs [2].

### Effects on Pregnant Woman

Meditation practice can reduce depression significantly in a High - risk pregnant woman.

### Stress and anxiety disorders

Mindfulness meditation treats anxiety and depression in a similar way as that of antidepressant drug therapy. A study from the University of Wisconsin - Madison indicates that the practice of "Open Monitoring Meditation" (such as Vipassana), reduces the grey - matter density in areas of the brain related with anxiety or panic disorders and stress [3].

### Meditation increases grey matter concentration in the brain

The studies showed that after meditation practice for 5 to 6 weeks, MRI scans show that the grey matter concentration increased in areas of the brain involved in learning and memory, regulating emotions, sense of self, and having perspective. Other studies also show a larger hippocampus and frontal volumes of grey matter for long - term meditators. Also meditators had a thicker prefrontal cortex and right anterior insula, which might offset the loss of cognitive ability with old age [4].

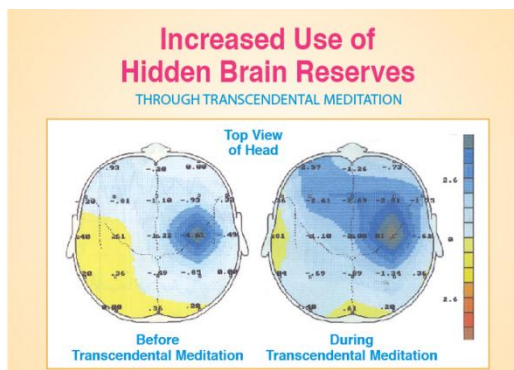


Figure 1: Increase in gray matter concentration after meditation practice [5]

### Meditation improves your focus, attention, and ability to work under stress

A study showed that during and after meditation training, practitioners were more skilled at keeping focus, especially on repetitive and boring tasks. Another study demonstrated that even with only 20 minutes a day of practice, students were able to improve their performance on tests of cognitive skill, in some cases doing 10 times better than the group that did not meditate. They also performed better on information - processing tasks that were designed to induce deadline stress [6].

Eileen Luders, an assistant professor at the *UCLA Laboratory of Neuro Imaging*, and colleagues, have found that long - term meditators have larger amounts of gyrification ("folding" of the cortex, which may allow the brain to process information faster) than people who do not meditate. Scientists suspect that gyrification is responsible

for making the brain better at processing information, making decisions, forming memories and improving attention. Scientists reported that the process of controlling the mind, through meditation, increases mental strength, resilience, and emotional intelligence.

### Meditation makes you stronger against pain

The study showed that meditation training can dramatically reduce both the experience of pain and pain - related brain activation. Scientists found a big effect – about a 40 percent reduction in pain intensity and a 57 percent reduction in pain unpleasantness. Meditation produced a greater reduction in pain than even morphine or other pain - relieving drugs, which typically reduce pain ratings by about 25 percent.

### Meditation increases the ability to keep focus in spite of distractions

A study demonstrated that participants with more meditation experience exhibit increased connectivity within the brain networks controlling attention. These neural relationships may be involved in the development of cognitive skills, such as maintaining attention and disengaging from distraction [7].

The following figure shows effects of TM on intelligence of the University students who were practising Maharishi's Transcendental Meditation and TM - Sidhi Programme increased significantly on intelligence in contrast to control students.

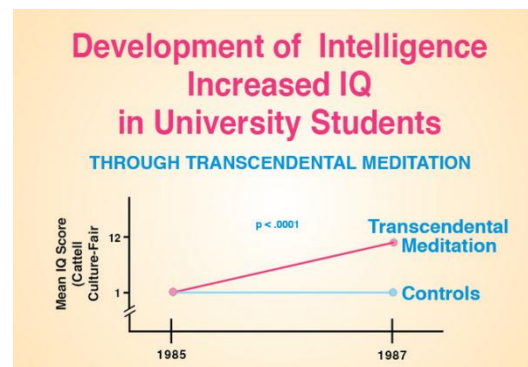


Figure 2: Increase in IQ through TM [8]

### Meditation improves Visio spatial processing and creativity

The Study has shown that even after only four sessions of mindfulness meditation training, participants had significantly improved Visio spatial processing, working memory, and executive functioning. Also Mindfulness meditation enhances creativity and divergent thinking.

### b) Body & Health

#### Meditation reduces the risk of heart diseases and stroke

The participants found that those who took the meditation class had a 48% reduction in their overall risk of heart attack, stroke and death. They noted that meditation "significantly reduced risk for mortality, myocardial infarction, and stroke in coronary heart disease patients. These changes were associated with lower blood pressure and psychosocial stress factors." [9]

Meditation affects genes that control stress and immunity, reduces blood pressure, decreases inflammatory disorders, decreases cellular - level inflammation, helps prevent asthma, rheumatoid arthritis and inflammatory bowel disease, Meditation and meditative prayer help treat premenstrual syndrome and menopausal symptoms, reduces risk of Alzheimer's and premature death. Mindfulness training is helpful for patients diagnosed with Fibromyalgia. *Meditation may make you live longer.*

### c) Relationships

Loving - kindness meditation improves empathy and positive relationships also reduce social isolation, decreases feelings of loneliness.

### 3) Science behind Mantra Chanting

#### *Mantra chanting induces vibrations*

Chanting Mantras is a scientific tool of inducing certain vibrations within oneself to channelize the cosmic energy through our bodies which maximizes our potential and expand possibilities. These cosmic vibrations can be heard in the form of sound. It is said that even before creation of the Universe, there existed vibrations which manifested as sound energy. Sound is the most primordial manifestation of energy in the cosmos. These vibrations exist all around us. However, our minds are so scattered that we are unable to perceive these cosmic sounds. When one can cut the clutter from the mind and be perfectly silent, physically and mentally, one can hear them [10].

#### *Procedure to be followed while chanting*

A common human being could not achieve that state of perfect silence. So she/he could never be able to experience the benefits of the cosmic vibrations. To overcome this obstacle and make the benefits of the cosmic vibrations available to the common man, the Rishis discovered syllables, which when uttered in the right manner, would induce the same vibrations within one's body. The Rishis studied the movement of the lips, the tongue, the contraction and relaxation of the muscles of the voice - box etc and came up with words which when pronounced or chanted in a specific manner would induce these vibrations. Hence chanting of Mantras follows a strict procedure of pronunciation, intonation and breathing. Therefore, the meaning of Mantras is of secondary importance, it is the vibrations induced that are paramount.

#### *Resonance between Organ's Basal Frequencies and chanting mantra*

Every organ in the human body has a basal frequency at which it vibrates, e. g. the heart beat, the peristaltic motion of the intestines, the stomach's contraction and relaxation etc. the cumulative effect of these vectors results in a particular frequency that is unique to an individual. When the basal frequency of an organ goes awry, diseases manifest. Certain specific mantras, if chanted properly and repeated over a period of time can induce vibrations within the body that can restore the basal frequencies. This, in turn, can take care of specific ailments.

According to the Wave Theory, resonance between two waves occurs when the two waves travelling in the same

direction and having the same frequencies, overlap. Regular chanting of mantras does exactly this. Chanting AUM induces vibrations within the body which are synchronous with the natural vibrations of the cosmos.

#### *Mantra chanting for Body and Mind*

These vibrations massage the organs, tissues, nerve cells, the endocrine glands etc. resulting in efficient functioning of the body. Chanting improves lung capacity. With regular practice, the practitioners experience recession of thoughts, concentration improves, stresses and tensions are released, thus calming the mind - body complex [10]. The therapeutic effects of AUM chanting coupled with Shavasana in rehabilitation of cardiac patients were first documented scientifically by Dr. K. K. Datey of the K. E. M. Hospital in Mumbai, way back in 1968.

### 3. Summery and Conclusion

In a nutshell, science confirms that, meditation keeps us healthy; helps prevent multiple diseases, make us happier, and improves the performance in basically any task, physical or mental. As meditation is making the practitioners calm, centered and focused, it is beneficial for the students also. The studies showed that it is now possible to develop brain functioning in its totality, for the enrichment of all aspects of life- mental potential, health, behaviour, and the society as a whole. what meditation can teach us may have tremendously useful effects on our physical and psychological wellbeing as it improves our functionality, changes the body physiologically and metabolically, indirectly improves our lifestyle, enhances relationships and compassions and the way we cope with life challenges.

### References

- [1] <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.418.9158&rep=rep1&type=pdf>
- [2] Wiveka Ramel, Philippe R. Goldin, Paula E. Carmona, and John R. McQuaid "The Effects of Mindfulness Meditation on Cognitive Processes and Affect in Patients With Past Depression", *Cognitive Therapy and Research*, Vol.28, No.4, August 2004 (C 2004), pp.433-455
- [3] <https://onlinelibrary.wiley.com/doi/pdf/10.1002/da.21964>
- [4] <http://www.sciencedirect.com/science/article/pii/S1053811909000044>
- [5] <https://www.globalcountry.org/wp/scientific-research-total-brain-development/>
- [6] Sources: Time Magazine, NCBI, Link Springer
- [7] Wendy Hasenkamp\* and Lawrence W. Barsalou; *Effects of meditation experience on functional connectivity of distributed brain networks*; Department of Psychology, Emory University, Atlanta, GA, USA
- [8] <https://www.globalcountry.org/wp/scientific-research-total-brain-development/>
- [9] Robert H. Schneider, Clarence E. Grim, Maxwell V. Rainforth, Theodore Kotchen, Sanford I. Nidich, Carolyn Gaylord - King, John W. Salerno, Jane Morley Kotchen, and Charles N. Alexander, "Stress Reduction in the Secondary Prevention of Cardiovascular Disease;

Randomized, Controlled Trial of Transcendental  
Meditation and Health Education in Blacks”

[10] <https://www.speakingtree.in/blog/the-science-of-mantra-chanting>