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A Review on the Study of Effect of Meditation on Human Brain

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Abstract: *In today's world, children are getting depressed due to the excess work load by the schools or the collages. The parents are worried about their child's future and due to their own professional life. The busy schedules don't let them to be relaxed and find the exact solution of these problems. Today as the stress level is increasing, it becomes mandatory for to practice the meditation regularly. In this review paper, the effect of meditation on human brain and two types of mediation is studied which help to improve the attention level and reduce other disorders slowly but continuously.*

Keywords: *Meditation; Zen meditation; Transcendental meditation.*

I. INTRODUCTION

Meditation is the process where an individual has to focus on a point or an object for a particular time period, after which the mind of an individual become totally relaxed. The person itself after regular period converts into the calm and peaceful one.

The daily life of an individual becomes so hectic that they are unable to get spare time for him or her. Due to which they are becoming victims of great anger, depression and lack of concentration, anxiety, hyperactivity disorder and many other disorders [2]. All the victims rush towards the physiologists and psychologists to overcome their problems and have relaxed and normal life span but no one tries to change their daily routine. As many researchers have studied that the meditation is the best medicine to cure the mental disorders, as it becomes the prime research area. Meditation can be practiced either with open eyes or closed eyes. There are number of yoga exercises or meditation traditions such as sahaji yoga, raj yoga, vipassana, isha shoonya, and Himalayan yoga [5, 7]. The results of these meditation practises can be analyzed on through EEG Signals. Further the EEG signals can be analyzed on the Matlab and Verilog Xilinx 14.7 on FPGA [3].

II. MEDITATION WITH OPEN EYES

The open eyes meditation is often known as Zen Meditation. Actually it's the Buddhist practice of meditation to make our mind and body stable. This practice involves the various thoughts, sensations or the feeling to arise while having a particular posture or position in a specific environment. This meditation can be practiced minimum 2 minutes in a day.

The steps to practice Zen

- 1) *Find a quiet and peaceful place:* whether at home or outside somewhere. Beginners can use the flowers, candles etc to make the suitable environment [10].
- 2) *Perfect posture:* sit on a chair or on the floor with crossed legs having some cushions or mat. Your head, neck and back must be in a straight line.
- 3) *Eyes:* with open eyes concentrate on a point or an object which is kept in front of you. After some time, your eyes naturally be in a position of rest i.e., half closed or half open.
- 4) *Hands:* put your left hand on the right facing towards the sky and place your arms on your thighs [9].
- 5) *Breathing:* take a deep breath with closed mouth and focus on the exhalation of the breath. Make a process slow and deep.
- 6) *Presence of mind:* during meditation if the various thoughts or feeling are arising, let them arise. Don't rush away from them as if you try to move away from them the more thoughts or feeling will rise. Just focus on your breathe.



Fig1. Zen meditation [13].

III. MEDITATION WITH CLOSED EYES

Meditation with closed eyes is also termed as Transcendental meditation. It's the type of meditation which involves chanting the name of any god or any mantra. TM exists from the Vedic period of India [11]. The minimum time period is 10 minutes. But it must be practiced for at least 15-20 minutes twice per day.

Steps for TM are

- 1) *Sitting position*: be comfortable while sitting, it's not necessary to sit with the crossed legs.
- 2) *Eyes*: closed the eyes and focus on your third eye.
- 3) *Breathing*: take a deep breath at least 3 frequently and be relaxed.
- 4) *Presence of mind*: start chanting the name of god or any mantra in your mind itself not verbally and realize the power of your words (feel energetic).

At the finish, wait for 2 minutes before opening the eyes.



Fig2. Transcendental meditation [13]

IV. LITRATURE SURVEY

S.No	Author's name and Year	Objective	Result and Conclusion
1.	Nugraha Priya Utama and Mingian Liu on June 2014.	The effect of change in the brain signals and mental changes are being measured. The self-relaxed position and the state of meditation were analyzed by asking 30 questions according the depth of meditation and activities of the brain using EEG.	The mindfulness meditation increases the relax level and reduces the hindrance as compared to the self- relaxation.
2.	Prajakta Fulpatil and Yugandhara Meshram on June 2014.	To study the nature of the complex person & situation using EEG during meditation. The EEG signals are analysed using wavelet	10 subjects were considered for the experiment. The data obtained was used to calculate the mean and standard deviation of

		transform.	each. The result was that the alpha frequency band was high in meditating persons in comparison to non-meditating persons.
3.	Sapana M Adhalli, H Umadevi, Guruprasad S P and Rajeshwari Hegde on May 2016.	The EEG signals of the meditating and non-meditating persons are analyzed using matlab & Verilog Xilinx 14.7 on FPGA.	The youth were more relaxed as compared to the persons with age group above 40. After meditation every age group was relaxed.
4.	Kulvir Kaur, Karamjeet Singh and R.S.Uppal on July-August 2017.	Study of the brain signals during meditation. The data was recorded using Nexus machine and implemented on LabVIEW and SPSS software tools.	Data of 25 subjects were taken before and after meditation. It has been observed that the delta and theta waves were increased in frontal & occipital lobes of brain. On the other hand, the alpha wave was reduced whereas; there was no change in the beta and gamma wave of the brain.
5.	Seema S.Kute, Sonali B. Kulkarni on May 2017.	The different yoga meditation was studied to improve the physical and psychological health of the humans.	The meditation can reduce the nervousness, increase the attention and concentration level of the humans.
6.	Jeffrey Jonathan Davis, Chin-Teng Lin, Grant Gillett, and Robert Kozma on 14 April, 2017.	Analyses of the open eye meditation and the closed eye meditation in laboratory environment using different analyzing tools and equipments.	The MINDO technology was used for spatial analysis and the representing brain dynamics with movies. The Mitsar 201 technology was used to gather data of the brain. The occipital and parietal regions of the brain are having fewer differences in modalities.
7.	Claire Braboszcz, B. Rael Cahn, Jonathan Levy, Manuel Fernandez on January 24, 2017.	The three meditation traditions were compared during meditative and instructed mind wandering block with control group.	The higher alpha activity was observed in the Vipassana group with 7-11 Hz in both the blocks. On the other hand, lower activity was observed in rest to traditions with 10-11 Hz in only meditative block.
8.	Abhilash M. Motghare, S. S. Thorat on Jan 2018.	To study the effect of meditation on the persons suffering from attention deficit hyperactivity disorder (ADHD).	The attention level of the students is required to measure to reduce the anxious, angry or depressed level time to time to improve their mental, physical and spiritual levels.

CONCLUSION

Meditation is the best medicine to cure the diseases. There are different types of meditation which need to be practiced by the human being, as it really reduced the anxiety, stress, anger, and the depression level and increases the attention and concentration power. The persons practising the meditation usually have longer and healthy lifespan as compared to the non-meditators.

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