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## The effect of Bhramari Pranayama and Jyoti Dhyana effect on alpha EEG and Hemoglobin of college going students

**Kamta Prasad Sahu, Kamal Kishore**

### Abstract

The present study was undertaken to study the effect bhramari pranayam and jyoti dhyana on Hemoglobin & Alpha-EEG level of collage boys. For this 50 boys were selected from Dev Sanaskriti University, Haridwar (Uttarakhand), who was studying M.sc/M.A first year in the year 2011 with the help of Accidental sampling and all the samples belonged to the age range of 20-24 years. Bhramari Pranayam and jyoti dhyana practice was given to all samples in a group for a period 1 month (10 Sep-10 Oct 2011) regularly with a definite pattern in the morning. Sahli's haemometer &  $\alpha$ -EEG Bio feedback apparatus test were used as data collection device. In this study t-test was used for statistical analysis. It is found that bhramari Pranayam and jyoti dhyana was found to have significant effect on Hemoglobin level & alpha EEG of the students.

**Keywords:** Yoga Nidra, social intelligence

### 1. Need of Study

In contemporary scenario of Globalization, everything has taken a compact shape; everything is in its rigid position. The socio-political economic condition of the states is more or less just the same throughout the globe. Whenever, a crisis occurs anywhere or with any states of the world, it impacts all the countries of the world. However, differences, lie on the strength of the state i.e., if a state is stronger it will suppress the weaker. It reveals that there is not the true progress of the mankind because; progress is absolutely away from all kinds of suppressions, which is not evident these days.

Now, the question arises that when all the scientific and physical progress has been achieved by the mankind which provides comfort and luxury then, why the mankind is so restless and barbaric? It is fighting brutal wars and terrorism; and has become a daily practice on the mother earth; which, disturbs not only the mankind, it disturb the complete bio-system and the Mother Nature. This earth does not belong to only homo-sapiens; it is the dwelling place of all creatures & lives. It is setting disturbed due to ill-behavior or because of human psychological disorders that human think themselves away from nature; while, God has made them the caretaker of the nature, complete natural and given them all the pious emotions healthy mind, beautiful body and sacred soul.

So, why? Man is getting away from nature & living not a single practice to accommodate or live inside the nature. Answer is the same; they are suffering from some chronic disorder in their behavior. This behavioral change has occurred due to many physical, mental interactions between man & man in a negative way which has altered their routine & perverted their mind they have cultivated many kind of barriers such as; racism, regionalism, all isms, which bars the free & healthy survival of their own. Now, this is the time to think over it & give a proper resolution to save the mankind and mother earth.

So, there is the need of my study based on sacred, old, vedic yoga practices which can save the mankind & earth and has potential to let them grow, prosper, proliferate & reproduce. It can make the complete humanity, survive on the earth forever. Else, they will destroy themselves & make the earth complete naked and barren forever. As, they have invented many lethal & highly destructive arms & ammunitions, such as, atom bomb, missiles, hydrogen bomb and bio-bomb etc.

Yoga is in short the union of psycho-spiritual & physiological balance of one's identity" i.e., body, mind & soul. As, yoga is very vast & it cannot be summed up in a brief dissertation as it

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teaches not only for one's own benefits rather it teaches & provides all the techniques which safeguards humanity & complete universe. Thus, I am concentrating on a single topic which is important for once holistic way of living in accuracy. In this jumbled situation of this crisis prone world.

As per **Swami Vivekananda**, "**healthy mind resides in healthy body**", so, we can say that unless and until the body is healthy our fluctuation of mind will not become stable and static. Before achieving a mental health we are unable to say that man can reach to its goal of harmony, prosperity and brotherhood.

The yogic technique especially Pranayama and meditation is the bridge between physical health and mental health. It provides both the physiological as well as psychological well-being.

**Bhramari pranayama and Jyoti dhyana** is a unique method by which it practiced can vitalize our self and thus can accomplish us with healthy body and pure mind. According to various texts only **Bhramari pranayama and Jyoti dhyana** can act as a beneficial agent to achieve the state of total health. I have also considered the new technique of Pranayama discovered by **Swami Niranjanand Saraswati**. This is based on the theory that **Bhramari pranayama** will help in cleansing the hypothetical energy channel present inside the human body and **Jyoti dhyana** will help in increasing the vital and cosmic energies into those channels and thus, will benefit the man.

The vitality and immunity of a person depends on certain physiological and psychological factors like- the level of Hb, TLC, Blood platelet,  $\gamma$ -globulin, CD4 count,  $\alpha$ -EEG, GSR, EMG, Respiratory bio-feedback, respectively. In this dissertation I have taken only two factors from each of them which can invariably show the immunity of a person.

The normality of the mind or in the other words we can say that the mental quanta of the man depends on how a person stabilizes in the environment and perceive the things. The factors like  $\alpha$ -EEG do show how a person may come over their hindrances, conflicts, negativities so to make them more stable in relation to environment. The increment of the  $\alpha$ -waves is directly proportional to the relaxative state of mind and the highest state is achieved when there is emission of theta ( $\theta$ )-waves I think the present condition of health is deteriorating due to lack of sensitiveness, lack of emotions and the deep rooted conflicts in human mind.

Even Swami Ramananda states that at least 80% of our physical disorder is of psychological origin. **Bhramari pranayama and Jyoti dhyana** are very helpful in decreasing the stress level for person and in turn providing them with mental health. My study is carried keeping all those things in mind, that how ours brothers can be benefited from it. How this particular package can help us to reduce our stress level and thus to increase our vitality, immunity so to revitalize and rejuvenate ourselves to fight against the external antigens as well as internal antigens of selves.

Today, in our world, we need two items to make our lives a complete success. The first item which we lack is "**vitality**", which is not physical strength, but inner strength, will power, clarity of mind and the ability to perform every action, with perfection. The second item we lack is *Tranquility*.

**Health is an extent of containing physical, emotional, mental and social ability to cope with one's environment.**

A healthy person is not only a boon to himself, but also to his nation and world at large. But now a day's life is becoming so

fast & hectic that every person faces annoying situation in their home, work place & academic life. Today on one side we see the technological excellence and related comforts and on the other side the hazards & disorders created by this growth.

The present study "**Impact of Bhramari pranayama and Jyoti dhyana** on the level Hemoglobin,  $\alpha$ -EEG among collage going students" has been taken after keeping in mind that this age group of collage going students are the future of society and nation. The HB counts show the vitality of human being somehow or the other.

**Objectives of the Study**

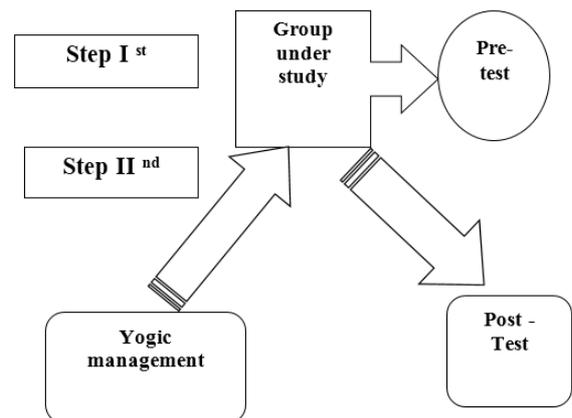
1. To investigate the effect of Bhramari pranayama and Jyoti dhyana on the Alpha-EEG level of students.
2. To investigate the effect of Bhramari pranayama and Jyoti dhyana on the Hemoglobin of students.

**Hypothesis: Null hypothesis**

1. There is no significant effect of Bhramari pranayama and Jyoti dhyana on hemoglobin level.
2. There is no significant effect of Bhramari pranayama and Jyoti dhyana on alpha EEG.

**2. Material and method**

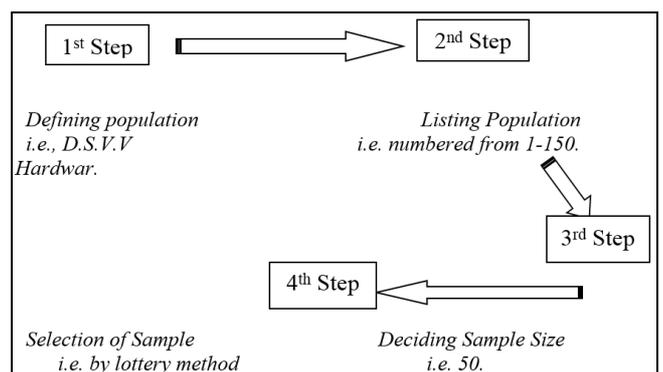
**2.1 Research Design:** One group Pre Test- Post Test Design is used



Where, firstly, 50 subjects of group A were measured with regard to Alpha waves and Hemoglobin. All factors were kept constant for 30 days (10 Sep-10 Oct 2011)) followed by Bhramari pranayama then after Jyoti dhyana.

**2.2 Sampling Plan**

**Sampling:** Simple Random sampling without replacement was used for the selection of sample under study.



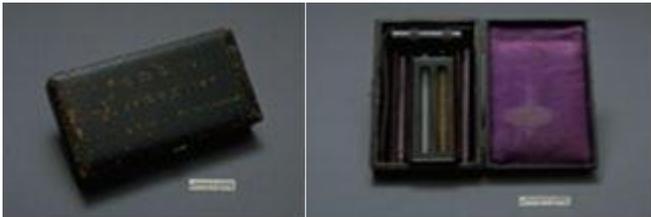
- Used Accidental Sampling for the study.
- Students of Dev Sanskrit Vishwavidalaya are taken for the study.
- All of them are PG Boys of ICTM, Psychology, and MJMC first Sem.
- Age of respondents ranges between 20- 24 years.

**2.3 Sample size**

50 subjects were taken for this study. The subject was taken from DSVV, Gayatrikunj, Shantikunja, and Hardwar.

**2.4 Tools**

**1) Sahli's Hemometer**



Sahli's haemometer designed by Dr. Herman Sahli (1900-19390)

Description: Hemometer is a hard rubber stand backed by a removable opaque glass plate; stand supports a removable graduate glass tube and a removable, sealed standard-filled rod; the rod is marked "GERMANY"; set also includes a glass dropping pipette, 20 cmm glass capillary pipette, rubber tubing and mouthpiece and glass vial with stopper in hard rubber case. Case is leather covered with satin and velvet lining; exterior of lid marked: Sahli's Hemometer manufactured by F. Buchi & Son Berne (Switzerland)". Cases 16 x 8.5 x 3.5 cm were used.

**2)  $\alpha$ -EEG Bio feedback apparatus**

A-EEG bio feedback apparatus are used to see the emission of EEG in particular time. The Cathode wires are set in the frontal and temporal bone of the brain & the number of Alpha-EEG emission are counted after setting the time in it.

**2.5 Procedure applied for the collection of data**

The collection of date is one of the most fundamental base in the experimental research design. This is the corner stone of the experiment. Therefore, I have taken the best technique for it.

**For Hemoglobin**

1. The samples of blood were collected from the participants one day prior of giving them intervention in bio-chemistry laboratory.
2. The hemoglobin count was determined using Sahli's thermometer.
3. The same procedure was applied to collect the post-data of hemoglobin.

**For  $\alpha$  – EEG**

In conventional scalp EEG, the recording is obtained by placing electrodes on the scalp with a conductive gel or paste, usually after preparing the scalp area by light abrasion to reduce impedance due to dead skin cells. Many systems typically use electrodes, each of which is attached to an

individual wire. Some systems use caps or nets into which electrodes are embedded; this is particularly common when high-density arrays of electrodes are needed.

During the recording, a series of activation procedures may be used. These procedures may induce normal or abnormal EEG activity that might not otherwise be seen. These procedures include hyperventilation, photic stimulation (with a strobe light), eye closure, mental activity, sleep and sleep deprivation. During (inpatient) epilepsy monitoring, a patient's typical seizure medications may be withdrawn.

“A typical adult human EEG signal is about 10  $\mu$ V to 100  $\mu$ V in amplitude when measured from the scalp [2] and is about 10–20 mV when measured from subdural electrodes.

Since an EEG voltage signal represents a difference between the voltages at two electrodes, the display of the EEG for the reading encephalography may be set up in one of several ways. The representation of the EEG channels is referred to as a montage.

1. In the psychology labs of DSVV the collection of data were taken.
2. The participants were asked to relax in comfortable chair.
3. They were then instructed to observe and concentrate on their breath.
4. With the help of  $\alpha$ -EEG biofeedback apparatus the reading was taken for 300 seconds.

The same procedure was applied for the post- data collection

**2.6 Technique used for intervention**

Time of intervention : 7:00 a.m. to 7:40 a.m  
 Days of intervention : 6 days except for Sundays  
 Total days of intervention : 30 days

**3. Result table Graph**

**Result table I**

**Hypothesis 1:** There is no significant effect of Bhramari pranayama and Jyoti dhyana on Hemoglobin level of college going students.

States	Mean	N	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pre Hb	9.33	50	0.88	0.12	10.19	49	p<0.001
Post Hb	10.13	50	0.74	0.10			

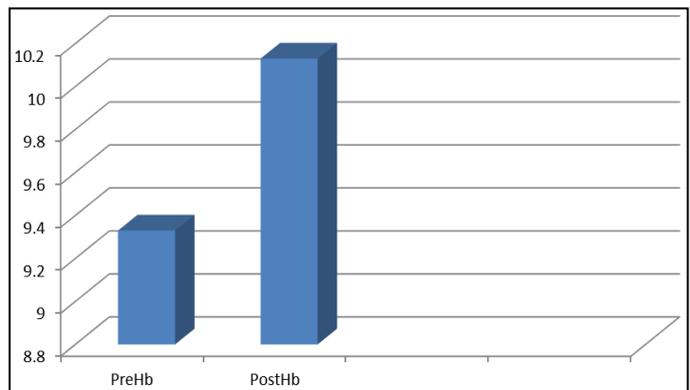


Table 1 shows significant increase in the HB level of experimental females, this indicates that Bhramari pranayama and Jyoti dhyana does effect the HB level.

So here hypothesis 1 is rejected

**Result table II**

**Hypothesis 2:** There is no significant effect of Bhramari pranayama and Jyoti dhyana on alpha EEG of college going students.

States	Mean	N	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pre Alpha EEG	5.43	50	1.08	0.15	23.38	49	p<0.001
Post Alpha EEG	9.08	50	1.46	0.21			

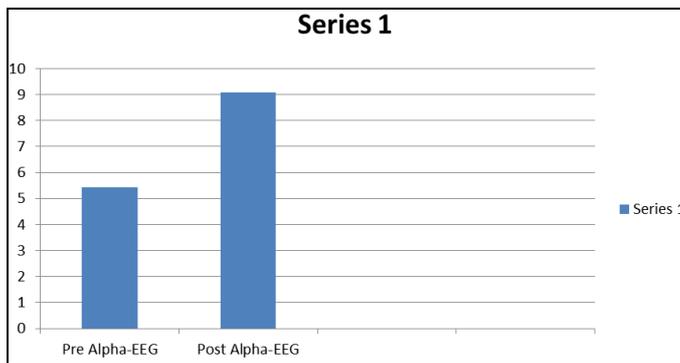


Table 2 shows significant increase in the  $\alpha$ -EEG level of experimental females, this indicates that Bhramari Pranayama and jyoti dhyana does effect the  $\alpha$ -EEG level.

So here hypothesis 2 is rejected.

#### 4. Interpretation & Discussion

Hemoglobin's primary function is to bind oxygen that diffuses into the bloodstream from the lungs and then transport it to outlying tissues where it is released primarily for aerobic respiration. Hemoglobin (**Hb**) has to the capacity to bind between **1** and **4** O<sub>2</sub> molecules, ranging from fully "desaturated" Hb (**deoxyHb**) to fully "saturated" Hb (**oxyHb**). Oxygen transport is a highly dynamic process with oxygen continuously being exchanged between the lungs and the capillaries. As part of this process, Hb also serves to replenish the "oxygen stores" maintained by myoglobin (**Mb**), the O<sub>2</sub>-binding protein in muscle which releases its oxygen in response to high levels of muscle activity. Hemoglobin also serves as the conduit for O<sub>2</sub> delivery to the fetus which carries a different form of hemoglobin in its circulation, **HbF**, or fetal hemoglobin, as distinguished from **Hb A**, or adult hemoglobin.

The dynamics of oxygen exchange is highly regulated by several metabolically-derived factors that collectively define the "oxygen demand" of an individual's tissues. Among the key metabolic factors regulating the dynamics of hemoglobin's oxygen exchange reactions is oxygen itself. When oxygen levels are high, the capacity of a partially saturated hemoglobin molecule to bind oxygen disproportionately increases with the number of oxygen molecules it has already bound. In other words, when environmental oxygen levels are high, partially saturated hemoglobin molecules exhibit enhanced affinity for binding additional oxygen molecules, a specialized behavior referred to as **cooperativity**. Equally important, hemoglobin also manifests cooperativity in the reverse direction: When environmental oxygen levels are low, hemoglobin's affinity for oxygen drops disproportionately as fewer and fewer oxygen molecules remain to bind to hemoglobin. Thus, the cooperative loading or unloading of

oxygen from hemoglobin, depending on the environmental concentration of oxygen. Effectively enhances the oxygen uptake and delivery capacity of hemoglobin. In this regard, hemoglobin is "**supersensitive**" to concentration of its ligand, O<sub>2</sub>,

Pranayama when done with kumbhaka (retention) like in Bhramari Pranayama, increases the efficiency of hemoglobin to carry more oxygen to the body cells. During the retention phase there is increase in the surface area of alveolus of Lungs inturn there is more transportation oxygen molecules to the body cells to help them in normal functionalizing. These inturn helps in increasing the functions of other tissues, which helps in making the hemoglobin.

Bhramari Pranayama techniques form an important component of yoga. It maintains a slow rhythmic pattern of breathing using both nostrils. Thus produces a balancing effect on the ANS. Short kumbhak or breatholding increases O<sub>2</sub> consumption while long kumbhak decreases O<sub>2</sub> consumption.

The breathing process is directly connected to the brain and CNS and it is one of the most vital processes in the body system. It also has some connection with **hypothalamus** which controls emotional responses. It transforms perception into cognitive experiences. Secretion of neurotransmitter is also under its control. If we breathe erratically impulses sends to this Centre and creates disturbed responses. As a result the level of GABA and serotonin is decreased which results anxiety. So by becoming aware of the nature of the breath and by restraining it, the whole system becomes controlled. (**Swami Niranjanaananda Saraswati 1994, HYP**) Although some yoga teachers don't even teach breath control, many teach specific breathing techniques that go with specific physical or mental practices, while others use more generalized breathing techniques in more general situations. Anecdotal and subjective feedback indicates that different patterns of breathing are promoted as being beneficial, sometimes with various esoteric and medical claims being ascribed to these techniques. While some yogic breathing and pranayama practices have been scientifically investigated, no study to date has fully described and cross-correlated the differential effects on the brain and cardiac-autonomic nervous systems of the all the main breathing techniques commonly practiced in yoga classes today. The best technique I have taken is developed by **Acharya Sri**, which is very easy to do and have higher efficacy.

(**Shannahoff-Khalsa-DS, 1993**). So by practicing Bhramari pranayama, we are helping to balance both of these systems in relation to each other as well as balancing brain activity.

"Bhramari Pranayama is a powerful practice that may be taught incorrectly by teachers that are unaware of the subtle nature of this practice" says researcher Philip Stevens who has researched the physiology of this practice and traveled widely running seminars educating people about the neurological effects of various yoga practices above and beyond the physical benefits.

Bhramari Pranayama and Jyoti dhyana is the best technique and can work as a good medicine in chronic diseases. Though it cannot be applied on the individual suffering from acute diseases, it has some limitations with it.

There is a report of doctors in the south of France who prescribe specific pieces of music to be listened to three times a day in place of medicine. There are reports of cows yielding more milk when played classical music in the barn. Higher consciousness music enhances life affirming decisions and results. Lower vibration music can direct the listener towards

negative destructive thoughts and sometimes even suicide.

"A tone is a living cell... It is a microcosm reflecting faithfully the macrocosm, its laws, and its center. A tone is a solar system." –

Nevertheless, as I feel and even this study shows that this particular Pranayamas and Jyoti dhyana, if practiced can help us to achieve the level of total health where we can make ourselves more immune and more sensitive for the external environment responses to fight against environmental stressors and antigens present inside the body.

Hope may GOD bless us all to achieve our target of Peace and Love. May we become sensitive to carry the Transcendental Bliss? May we sleep in pure and sacred silence of lightened consciousness?

## 5. Conclusions

After showing the result of this project work we may conclude that Bhramari Pranayama pranayama and Jyoti dhyana play a significant role in level increasing alpha waves and Hemoglobin. After practice they show significant changes in alpha EEG and Hemoglobin. But if one practices regularly it surely shows significant effect.

Spiritual life and experiences are independent of academic ability and intellectual or mundane knowledge. Spiritual knowledge, power and experience exist on a different plane altogether. Even a debauchee can perceive the nada and dwell in the greater experience. Anyone who hears it should listen intently, excluding other experiences and thoughts so that mundane state of consciousness is illumined.

The pranic body is the intermediate link between the physical body and mind. Therefore, it can be approached from either side. It is, however, easier to control and purify the pranic body through the physical body. By strengthening the sympathetic nervous system, ida and pingala nadis are directly affected, and by developing the central nervous system, sushumna is activated. Therefore, the most important practice of Nadishodhana Pranayama which arouse the central nervous and sushumna.

To remove these obstacles from the path of health, one has to practice this pranayama and jyoti dhyana regularly. Researches also proved this. Jyoti dhyana increases concentration power which results in incensement of alpha waves. This is the sign of relaxed mind. Bhramari Pranayama pranayama also showed such results. In this way by these practices we fully attain health. It is said that **"If we shall be healthy mentally then automatically healthy by body"**

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