



physical structure in human. This action purifies Mahāprāṇa (5). In addition to it, Yajña influences spiritual values and life style changes (6). Chanting of Mantras produces vibrations which makes human body to resonate to Mantras' mystic powers and responds in greater manner (7). These vibrations reverberate and spread specific energy waves in the surrounding atmosphere while the oblations are offered with specific chants (6). So Yajña has physical, psychological, spiritual and social value.

The entire process of a Yajña, consisting of mantra chanting, lighting the sacrificial fire and offering *Havis* to the gods in the

form of ghee, *Vanaspati* (materials from plants and trees) and other objects, purifies the environment significantly. In fact, Yajñas have been successfully performed even in modern times to induce rainfall, to check spread of epidemics, and for various mundane and spiritual purposes.

With reference to Yajña, Śrī Kṛṣṇa says in Bhagavad-Gita, "The devotees of the Lord are released from all kinds of sins because they eat food which is offered first in sacrifice. Others, who prepare food for personal sense enjoyment, verily eat only sin." [Bhagavad Gita 4.31] "Serve the gods through Yajña and let the gods be gracious to us. Thus, each serving the other selflessly will attain the highest good." [Bhagavad Gita 3.11] (8) "Through Yajña, deities went to heaven, enmity transforms to friendship, so Yajna is considered to be the greatest performance one can deliver as an action. Oblations given to Agni reach the Sun, which in turn transforms that into clouds through vaporization resulting in rainfall and gives back in the form of food grains which is the base for human progeny." [Manu Smṛiti 3.76] (9)

### 3. EPI Electron Photonic Imaging, also known as GDV (Gas Discharge Visualization)

EPI was developed by Professor K. G. Korotkov on the basis of Kirlian effect. EPI is an instrument, which measures human energy field. It is computer registration and analysis of 'Gas Discharge Glow' (GDV-images) of any biological object placed in a high intensity electric field. EPI studies involve placing the object on a glass electrode and an electronic circuit provides a high-intensity electric field (with duration 10 microseconds applied with frequency 1024 Hz). As a result of impulse effect a sequence of gas discharge is formed during the specified exposure time. Spatial distribution of the glow emitted by the discharge is registered with a light-sensitive CCD matrix (a charge-coupled device) situated directly under the glass electrode.

#### 3.1 EPI Parameter

Several parameters are derived from the image obtained in the EPI instrument. These parameters are related to functioning of physiological systems of the body. Overall activity of the body mind complex to stress inputs and balances in energy could also be calculated. We present here one parameter of importance, known as Activation Coefficient the details of which are presented below.

#### 3.2 Activation Coefficient

It is one of the EPI parameters to analyze the level of a person's involvement to stress-adaptation. This also provides the level of stress and balance of activity of sympathetic and parasympathetic nervous systems work. Table 1 gives the values of Activation Coefficient and the observed psycho-emotional states (10).

**Table 1:** Activation Coefficient Level and its interpretation

S. No	Activation Coefficient	Condition
1	0 to 2	Calm balanced condition meditator, slow / deferred response, sluggishness
2	2 to 4	Normal level of stress reaction, compensated, active emotional
3	4 to 6	Emotional excitement (driving, surgeons)
4	6 to 8	High emotional excitement, emotional overload
5	8 to 10	Psychological problems; inadequate state

## 4. Methodology

### 4.1 Aim

To compare the influence of Yajña and Yogāsana practice on the Activation Coefficient of GDV diagram in normal healthy individuals.

### 4.2 Objectives

- To study the impact of Saraswati Yajña at psycho-emotional level of Yajña participants,
- To study the psycho-emotional level in Yogāsana group, and
- To compare the psycho-emotional level of Yajña group and Yogāsana group.

### 4.3 Hypothesis

- Null Hypothesis:  
Ho=There is no difference of impact of Yajña and Yogāsana on psycho-emotional level of healthy volunteers.
- Alternative Hypothesis:  
Ha=There may be some impact of Yajña and Yogāsana on psycho-emotional level of healthy volunteers.

### 4.4 Research Design

Day 1

Pre EPI test -----Yogāsana ----- Post EPI test

Day 2

Pre EPI test -----Saraswati Yajña---- Post EPI test

Design of the study was one group comparative study, between Yoga session and Yajña session; the two interventions were provided on two consecutive days.

EPI – grams were captured for all ten fingers of the subjects without filter and with filter in succession using EPI equipment. Then subjects practiced one hour of yoga taught by experienced instructors. Yoga session includes *Sūryanamaskāra*, *Pranayama* and Deep Relaxation Technique (DRT 5 minutes). After the practice, once again

EPI parameters were recorded. Next day morning subjects were made to attend Yajña session. Yajña procedure includes *Gaṇapati Pūja*, *Puṇyāha Vācana*, *Kalaśa Pujā* and *Varuṇa Pūja*, invoking and worshipping *Saraswati* in *Kalasha*, chanting of particular Mantras, offering oblations with Mantra chanting and *Prārthana* or prayer. EPI parameters were recorded before and after the Yajña session recorded.

#### 4.5 Sources of Subject

Participants were from various countries who recently went through one month of YIC (Yoga Instructor Course) at Praśānti Kuṭīram, SVYASA Yoga University, Bangalore. Sample size (n) is 18 (6 females, 12 males).

#### 4.6 Inclusion Criteria

- Willing to participate in the study
- Both male and female subjects were selected for the study.

#### 4.7 Exclusion Criteria

- Participants with missing fingers
- Females during their menstrual cycle and pregnancy,
- Those who have cardiac, neurological and psychological problems.

#### 4.8 Ethical considerations

- Signed Informed consent of the respondents were obtained before the start of the intervention,
- The participants in the study were explained about the nature of the study in detail

#### 4.9 Interposition / Intervention

For Experimental session:

Saraswati Yajña was designed referring to the classical texts. The Yajña program (70 minutes) was as follows:

1. Prātasmarāṇa stotra (morning prayer) (3 minutes)
2. Gaṇapati puja (worship of Gaṇapati to remove obstacles) (4 minutes)
3. Puṇyāha vācana (selected Mantras for auspiciousness) (10 minutes)
4. Kalaśa puja and Varuṇa puja (installation of deities in copper pot and worship) (10 minutes)
5. Sthalaśuddhi and Agnisthapāna (cleansing the place and installation of Fire) (10 minutes)
6. Chanting of Saraswati Mantra 108 times (20 minutes)
7. Offering holy sticks along with Saraswati mantra (10 minutes)
8. Prārthana or prayer (concluding prayer) (3 minutes)

The Yoga session (60 minutes) is as follows:

1. 10 minutes loosening practice
2. 10 minutes breathing practice
3. 10 minutes Sūryanamaskāra
4. 10 minutes Pranayama, and
5. 20 minutes deep relaxation technique (DRT)

#### 4.10 Data Collection

On the first day subjects were asked to come at 05.00 A.M. in the morning on empty stomach. GDV-grams were

captured for all ten fingers of the subjects first without filter and then with filter using GDV-camera. After the practice, once again GDV parameters were recorded. Next day morning subjects were asked to come at 05.00 A.M. on empty stomach and participated in a Yajña session. GDV parameters were recorded before and after the Yajña session.

#### 4.11 Data Analysis

All variables were expressed as mean  $\pm$  standard deviation. A paired sample t-test was used for analysis of pre-post changes in the two groups. Statistical significance was set at  $p < 0.05$ , and all the analyses were performed using SPSS 12.00 software.

### 5. Results

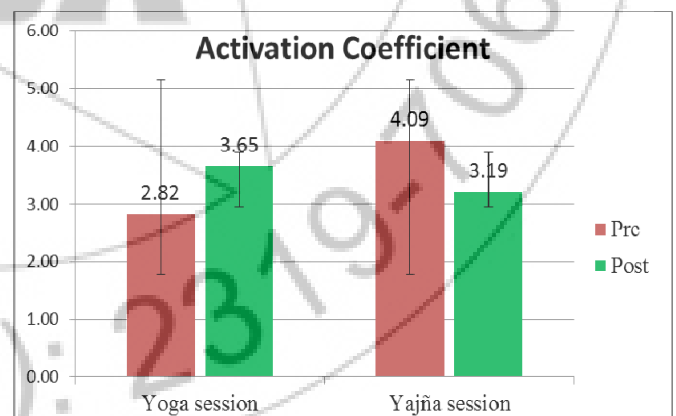
Shapiro-Wilks test was used for normality test. The data were normally distributed with  $p > 0.05$ . To assess the impact of session (pre-post assessments) paired sample t-test was used within the group. The results are tabulated in the tables below.

**Table 3:** Yajna and Yoga Session pre-post recordings

	Pre		Post		p value
	Mean	SD	Mean	SD	
Yoga Session	2.82	.97	3.65	1.98	1.05
Yajña Session	4.09	1.88	3.19	1.47	0.021*

\*  $p < 0.05$  comparing the pre and post scores using the Paired sample t-test

Changes are observed in both groups but Yajña showed statistically significant result compared to Yoga session. Significant reduction in Activation Coefficient, [ $p = 0.021$ ] was seen in Yajña session but not in Yogāsana session.



**Figure 1:** Comparison of Activation Coefficient of Yoga and Yajna sessions, pre and post

### 6. Discussion

The result shows that P-value is statistically different when two groups are compared to each other. Mean and standard deviation of Activation Coefficient changed more in Yajña session indicating the influence of reduction in stress level during Yajña.

- 1) Yajña involves a set of performances. The deity on which Yajña is being performed is meditated on deeply by all who are gathered there. The process of pondering upon one subject (deity or ritual in the context of Yajña) makes mind to concentrate and slow down breathing, subsequently influencing the state of the mind. Hatha Yoga Pradīpika provides strong relation between breath and mind; if mind is roving the breath is unsteady, meaning breathing pattern is highly disturbed and if the breathing is disturbed so is the mind.
- 2) Ayurveda incorporates Dhūmapāna (inhalation of prescribed smoke) in dinacarya (daily routine) for many diseases as a therapeutic practice. Smoke emanating during Yajña facilitates body to be energized through inhalation of the specific ingredients that are offered to fire. Thus it is hypothesised that stress level could come down. (11).
- 3) A recent paper has shown unequivocal increase in brain blood flow when there is oxygen deficit in the brain. The deficit comes about when a person suspends breathing for as short a time as 15 seconds. MRI shows increase in brain blood flow in wide areas of the brain due to increased CO<sub>2</sub>. In case of reduced intake of oxygen, a similar response could be visualized whereby there is a gradual increase in arterial PCO<sub>2</sub>. "Carbon dioxide is a cerebral vasodilator; therefore, an elevation in PCO<sub>2</sub> will subsequently increase whole-brain cerebral perfusion, resulting in a decrease in the deoxyhaemoglobin concentration of the cerebral blood and ultimately a whole-brain increase in the .... fMRI signal". Thus, Saraswati Homa smoke from fire wood could cause better brain blood flow through internal feedback mechanism leading to reduced stress level indicated by Active Coefficient.
- 4) Participants were asked to chant Mantras related to one of the deities, Saraswati. Recitation of Mantra in particular – which has an emotional component – could influence the person to calm down and hence bring down stress level. Subjects were educated about Mantras and the connected Devata of Mantra which made them focus towards recitation. This focus could also have caused reduction in stress level.
- 5) Though there is an increase in Activation Coefficient in Yogāsana session, these tend to bring balance in autonomic functions, including sympathetic and parasympathetic nerves in the optimal range indicating normal stress level, at eustress level. Hence it is inferred that stress level increase from Yogāsana are balancing than aggravating.
- 6) It has been shown that the physiological benefits of Yoga could have a dose-response behaviour. In other words, the more one practices Yoga, the more are the benefits seen [13]. Thus, a short session of Yoga could be only a start of a long process and may not indicate beneficial effects as seen in this study. To have a good comparison, at least three months of yoga practice is required before we could say with any certainty if one procedure is better than another.
- 7) Yagna, if performed properly needs special persons who could chant the Sanskrit verses with correct intonation and style. It is also expensive to perform a yagna. Thus, performing yagna at home or in a temple is a consorted effort, needing resources that are usually kept for special

occasions only. Yoga on the other hand is a self-help procedure and could be easily learned and performed anywhere in the world. Regular practice of Yoga could help in many areas, including in the management of stress.

- 8) It is possible that 'meditative component' is strong in Yagna and not as much in this particular practice of yoga. Effectiveness of meditative components in reducing stress through central processing of information has been demonstrated in studies [14]. Yoga, as practiced here, has no specific meditative component whereas Yagna is based on dharana or withdrawal of the senses and concentration on mantra and the devata. Thus, it is not surprising that Yagna is more effective in reducing stress-related components in EPI.
- 9) Thus, while short term benefits are seen in Yagna performance, practicality of learning and practicing Yoga along with meditation is an important adjunct in the management of stress in individuals.

## 7. Conclusion

Yajña, a spiritual practice mentioned in various ancient texts of Indian philosophy, showed therapeutic effects which are also mentioned in texts. Medicinal plants and ghee are the main materials for Yajña. This study has shown that one hour of Yajña can reduce stress level more efficiently than one hour yoga session as measured by Activation Coefficient of EPI- gram. Thus, Yajña can also be practiced for more effective results for stress management programs. However, it is also be noted that Yoga practice can be useful in balancing the energy system in a person.

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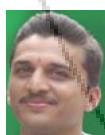
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