

# Innovations

## **A Study on the Role of Single Sound-based Pranayama in Stress Reduction in Moderately Stressful Individuals Working in a Medical Institution**

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### **Introduction**

**Abstract :** *Stress is a widespread medical condition that has permanently engulfed the human race worldwide in the past few decades. This study was focused on measuring the changes in the stress level of moderately stressed individuals working in a medical Institution using a single sound-based pranayama tool called Brahmari Pranayama (Bhr. P). The essence of life is the vital force of Prana. According to Yoga Philosophy, whatever exists in this world is controlled by Prana, the vital force<sup>5</sup> Similar to energy, Prana can neither be created nor destroyed. It exists along with the soul and diminishes with it. Prana flows continuously throughout and any distortion in its path leads to ailments or Aamaya. Hence, the correction of Prana in Yoga is done using Pranayama. Brahmari Pranayama (Bhr. P) is a Sound-based Pranayama that is described as one out of eight pranayama Practices in Hatha Yoga. The word 'Bhramari' " originated from the Sanskrit word "Bhramaram" which means the black bumble bee with a hissing sound, depicting the process in the pranayama<sup>7</sup>. The study's main objective is to find out the immediate role of Bhr. P in moderately stressed individuals after two weeks of regular Pranayama practice, Twice daily.*

**Keywords:** *Brahmari Pranayama, Stress, Moderate Stress, Yoga*

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## Methods

The study was done on 10 individuals aged 25 - 45 years working in private medical institutions in South India. Most of them were in similar working environments. The data on their stress levels were identified before the intervention using the Perceived Stress Scale for Adults (PSS-A) which stated that all the subjects come under the group 'Moderate Stress'.

Regulatory and ethical aspects of this trial include an Institutional Review Board (IRB)/Ethical committee, Data Use Agreements, and informed consent from the participants.

All Participants provided written informed consent before the study. Intervention in the form of a Single sound-based *Pranayama* called *Brahmari Pranayama* (Bhr. P) was made to systematically practice 10 rounds each, twice daily for 22 days, under guidance. The Pre and post-evaluation will be using the same scale. It was already shown in some studies that Regular Practice of Bhr. P can produce a relaxed state; parasympathetic activity overrides sympathetic activity<sup>1</sup>. A similar study showed that humming generates

the lowest stress index compared to all three other activities (physical activity, emotional stress, and sleep) Bhr. P can be an effective stress-buster based on assessing several HRV parameters during its practice and in comparison with other activities. A regular daily humming routine can help enhance the parasympathetic nervous system and slow down sympathetic activation<sup>2</sup>. T. Jagadeeshan et al suggested that there was a significant psychological effect on stress levels, depression, and anxiety. In addition, the patients stated significant improvement in quality of sleep (PSQI; and quality of life (WHOQOL-BREF) after the intervention in COVID-19 patients<sup>3</sup>. Karel et al (2000) concluded that "Bhr. P reduces anxiety, stress, aggression, insomnia, and depression and is very useful after neurosurgery". The *Pranayama* like Bhr. P stimulates the reflex of the Autonomic Nervous System in turn the level of noradrenalin, a component that functions as a hormone and neurotransmitter in the nervous system, actually increases with a deeper breath and resonates while exhaling<sup>4</sup>.

Since the study focused on finding the immediate effect of the pranayama, the intervention was given regularly for a short period. The post-evaluation was taken after 22 days of practice twice daily, using the same scale, and the effects were recorded. Any other *Yoga* interventions were completely avoided and all 10 participants were regularly monitored for 22 days with daily attendance.

**Inclusive and Exclusive Criteria:**

The selection of the Participants was purely based on Inclusive Criteria. The enrollers were assessed using PPS(A), from which 'moderately stressed' participants between 25 to 45 years were selected. The enrollers who are currently under medication and continuing *Yoga* of any kind are avoided. The

enrolees who are physically unfit/unhealthy have also been not selected. (\*\*Figure: 1)

**Results**

All 10 participants who signed consent were evaluated using the PSS(A), of which 60% were females and 40% were males. The participants were in the age group between 25 to 45 years out of which ~70% were between 30 to 40 years of age. Both Pre and post-evaluations were marked using the scale which showed a significant reduction in stress on post-evaluation. The total attendance (both morning and evening) was counted and was measured to be approximately (~63%) during the intervention period.

At a 95% confidence interval, the difference between post and pre-mean turned out to be 4.60 to 14.20, df=9, SE= 2.12, P value=0.0016 (P < 0.05)

Pre-Test skewness	Post-test skewness	P value	Mean of Pre-test minus post-test	95%Confidence interval difference between two means	t value	df	Standard Error
0.37936	0.024908	0.0016	9.40	4.60 to 14.20	4.4345	9	2.12

\*Table:1 Statistical evaluation of pre and post-intervention with PSS(A)

**Discussion**

The main focus of the study was to determine the effect of a single Pranayama in stress reduction using an extensively used assessment scale in Indian Population- PSS-(A).

All the study participants were working in a hospital atmosphere, most sharing similar work patterns. On the Pre-evaluation, all the participants were under the category of Moderate Stress. From Previous pieces of literature, it was clear that Yoga had a greater effect in reducing the stress levels of populations. The interventions were shown to result in significant short-term benefits that were maintained in the long term. However, the participants were very enthusiastic and even in the practices. The total attendance, both the time was measured to be (~63%) during the intervention period. The expectations of the study participants have been reported elsewhere<sup>6</sup>. Participants' expectations centered around their hopes for changes in their health, their wishes for control of their stress and the ability to relax, and their desire for peace of mind and inner calm<sup>6</sup>.

Even though *Bhramari pranayama* was extensively used in stress reduction by Yoga practitioners, its scientific reliability was often questioned. However, there is an enormous opportunity to study the effect of Bhr. P in the Human brain, using the standard EEG evaluation which might interpret a change in the Brain waves to analyze the relaxation produced after the practice. Yoga is the hope of the future in the stream of psychological and mental distress. It is seldom explored by its original meaning. Hence, the positive statistical aspect of this study might be a golden feather in the crown of clinical Yoga.

Among the participants with moderate levels of stress, Bhr. P was found to be very effective.

### **Conclusion:**

By conventional criteria, the mean difference at a 95% confidence interval is considered to be very statistically significant ( $P=0.0016$ ) (\*table:1)

However, further trials with large sample sizes are required to confirm the long-term effect of Bhr. P in stress reduction. ( $P < 0.05$ )

### **Author Contribution Statement:**

The authors confirm their contribution to the paper as follows: "A Study on the Role of Single Sound-based *Pranayama* in Stress Reduction in Moderately Stressful Individuals Working in a Medical Institution"

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