



Review Article

BHRAMARI PRANAYAMA: A NON-PHARMACOLOGICAL APPROACH AGAINST CURRENT CORONAVIRUS DISEASE 19 PANDEMIC

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ABSTRACT

For maintaining sound physical and mental health it is extremely beneficial for mankind to do *Pranayama*. *Pranayama* brings about varying physiological and psychological effects. *Pranayama* is a branch of yoga practice and also considered as the fourth limb of ancient *Aṣṭāṅga yoga* consisting of breathing techniques. This article aims to attain an insight on the effectiveness of *Bhramari Pranayam* (Bhr.P) on health and explores its need to be implemented in day to day life as a routine by all individuals in current Covid 19 pandemic. The studies done in previous years were found using Medline, Embase, Google Scholar, PubMed and manual search. Studies conducted on the health effectiveness of *Bhramari Pranayama* specifically were included in this study. It has been tried to keenly understand the role of *Bhramari pranayama* in particular and exploring some new concepts related to it in this review. Features of *Bhramari Pranayama* are dealt in detail with its potential effects on various systems of human body and its potentiality as a therapy tool. In the studies incorporated, the *Bhramari pranayama* practices have shown para-sympathetic dominance. There are some uplifting effects of *Bhramari pranayama* on different physiological systems. In holistic yoga therapy schedule *Pranayama* is also an integral component which involves slowing down of the normal breathing rate along with an internal awareness and conscious inner focus on the respiration and reduces stress which finally causes improvement in stress related ailments due to Covid 19 pandemic.

INTRODUCTION

Prāṇāyāma is among the most important yogic practices. Yoga includes practice of specific posture (*āsana*), regulated breathing (*Prāṇāyāma*) etc.^[1] *Maharishi Patanjali*, in his *Ashtanga yoga*, has given more importance to *Pranayama* than *asana* for good health.^[2] In human beings, the breath is an active connection between the body and mind while the *Pranayama* is considered as manipulation of once own breathing.^[3] *Pranayama*, by regular practice reduce the dead space and as a result decrease the workload of breathing. Shallow breathing only refreshes the base of the lung, on the other hand lung as a whole get ventilated as a result of *Pranayama* practice.^[4]

Prana is the vital or etheric force which is more subtle than air and can be defined as the energy essence that is within everything in the universe. *Yama* means to 'control'. *Pranayama* can be defined as a series of techniques which stimulate and increase the vital energy and ultimately bringing about perfect control over the flow of *Prana* within the body. *Pranayama* should not be considered as just breathing exercises, aimed at introducing extra oxygen into the lungs, though of course this is a very valuable aspect. *Pranayama* utilizes breathing to influence the flow of *Prana* in the *Nadis* (*Pranic* channels) of the *Pranayama kosha* (the body of bio energy) purifying them and also induces physical and mental stability.^[5] And thus finally, helps in increasing or normalizing the oxygen concentration in blood. Oxygen is said as *Vishnupadamrita*^[6] by Acharya Sharangadhar i.e. nectar of the atmosphere, which is essential for cellular metabolism or aerobic metabolism.

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Importance of Breathing Style in Life Span

Man's life span depends much on his mode of respiration. Most of us breathe incorrectly, using only a small part of our lung capacity.^[7] A person who breathes in short, quick gasp is likely to have a shorter life than a person who breathes slowly and deeply. The ancient Yogis estimated a person's life span, not in years but by the number of his/her respirations. They considered that everyone is allocated a fixed number of respirations in his life, differing for each person. Life can be prolonged by making each respiration longer. By breathing deeply one is able to get more vitality or *Prana* from each respiration. Respiration is directly related to the heart. Slow respiration occurs with a slow - beating heart, and a slow beating heart is conducive to long life.^[8] As it has been told in lay man's language that "jab tak sans tab taka aas".

The duration of inhalation in the day brings man's mind into relationship with the external environment. The duration of exhalation predominates during sleep and allows man to enter the world of peace and rest.^[9]

Bhramari Pranayama

Bhramara means a huge black colour bumble- bee and its name is so, because during exhalation a soft humming sound likes that of a bumble-bee is produced.^[10] The *Bhramari Pranayama* is supposed to be the commencing stage for balancing the mind and also for internalizing the awareness.

Dhyan is 8 times superior to *Japa*, *Tapa* (austerity) is 8 times superior to *Dhyanan*, and music is 8 times superior to *tapas*. There is nothing greater than music.

The ideal posture for *Bhramri Pranayam* is comfortable meditation *Aasana* which can be *Padmasana* or *Siddhasana* keeping spinal cord erect and the head straight. Bring the hands upto the ears by raising the arms sideways and bending the elbows. Obstruct the passage of ears by using the index or middle finger. Inhalation followed by slow exhalation has to be done in a controlled manner meanwhile making a deep steady humming sound. The Humming sound should be smooth, even and continuous during the duration of the exhalation. This is one round.

Duration: Five to ten rounds are sufficient in the beginning which can be increased to 10 to 15 minutes.

Time of practice: the best to practice is early morning or midnight. However, it can be practiced anytime, subject to peaceful surrounding.

Contraindications: It should not be performed while lying down and those who are suffering from severe ear infections also should not do.^[11]

Need for the Review

There are a number of benefits of practicing *Bhramari pranayama* and various studies have been

conducted exploring these benefits, still there is a dearth of available documentation on specific *Pranayama* individually. The Bhr.P is one unique technique having many health benefits but very few scientific evidences available showing its effects. Most of the literatures that are available are having shared effects of *Pranayama* practices as a whole. We have systematically reviewed the available studies and in this literature review, attempts have been done to explore the existing scientific studies on the Bhr.P. This review could lead in further for recognizing gaps in the existing studies as well as exploring the new floor for scientific advances in this field.

METHODOLOGY

Search Criteria

The search was done online in Medline, PubMed, Embase and Google Scholar as well as manual search was also carried out till June 2021 to make the search exhaustive and identified multiple studies done on *Bhramari Pranayam*. The key words used were *pranayama*, *Bhramari pranayama*, benefits, effects, practice of *Bhramari*. The words having similar meaning of the key words were also used for the search.

Selection of Studies

Inclusion Criteria: The studies done specifically on *Bhramari Pranayam* and its benefits over various bodily systems.

Exclusion Criteria: The studies that don't include *Bhramari Pranayam* practice were excluded.

Relevant literature also collected from available textbooks and newspaper articles.

Data Extraction

After the in depth search and sorting out studies based on the inclusion criteria, the data extraction was done. Then the final set of manuscript was prepared by the authors and information was thematically extracted. The data extracted include the objective of the study, the methodology employed, salient findings and the conclusions of various researches.

Data Synthesis

After the data extraction, the data synthesis was done by categorizing the study findings under different relevant headings.

RESULTS

Why Bhramari Pranayam is more Relevant than other Pranayam and Yoga

For achieving good breathing pattern, there are various ways and forms of *Pranayama* that also cures many disorders. "*Bhramari*" is one such technique that is intensely practiced in yogic exercises. It is considered as one of the kind of traditional yogic breathing practice that not only includes a unique breathing technique but also related with

simultaneous causing a constant humming sound generation during the phase of expiration making the body feel in the state of relaxation. Its simplicity of slow breathing and that it could be smoothly practiced by everyone without any age or gender related foundation makes it notifiable.^[12] In Bhr.P, the practitioner will sit in any posture that is comfortable, inhale and exhale through nostrils slowly and deeply.^[13]

Mantra repetition technique seems to be parallel to this when we look into the benefits of this *Pranayama*. *Bhramari* impacts the normal breathing rhythm, by prolonging the exhalation and shortening the inhalation period producing significant effect on physiological system.^[14]

Effects of *Bhramari Pranayama* on Human Physiology

Each and every form of *Pranayama* has its own beneficial effect based on their technique involving breathing cycle, tidal volume and other factors like the use of mouth, nostrils, constriction of laryngeal muscles and position of the glottis.^[15] The humming sound of *Bhramari pranayama* induces sleep and is good for persons suffering from insomnia.^[16]

Bhramari practice also plays a significant role for normalizing the hormonal imbalance and also improves other disorders like hypertension, anxiety, and depression.^[17]

Effect on Skin

For tightening and firm up the skin a basic *Pranayama* daily can be helpful. Most importantly, *Yoga* provides mental peace and emotional balance, both of which are important to radiate beauty from within.^[18]

Effect on Cardiovascular System

Slow type of yogic breathing techniques improves cardiovascular and autonomic variables which might be useful for the prevention and the management of cardiovascular disorders.^[19] Through dominance of parasympathetic system, *Bhramari pranayama* practice improves various cardiovascular parameters in adolescents and it can be practiced routinely for the reduction of stress induced cardiovascular risks in their upcoming period.^[20,21] The practice of *Bhramari pranayama* causes the parasympathetic dominance on cardiovascular system due to its effect in reducing diastolic BP, systolic blood pressure and mean arterial pressure.^[22]

Bhramari pranayama (a type of slow breathing) causes significant reduction in the cardiovascular hyper reactivity.^[23,24]

Two studies have been done in past by using the cold pressor test of which one was on the normal adults while another was done on pregnant women. Those women who were hyper reactive were found to

show reduction of blood pressure as a response to the cold pressor test by two months regular practice.^[25]

Effect on Respiratory System

In healthy individuals *Bhramari pranayama* and OM chanting are immensely effective in improving the pulmonary function.^[26] Deep breathing exercises, even for a few minutes' duration is beneficial for the lung functions.^[27] Practice of Bhr.P on a regular basis improves the lung function in healthy adolescents. However further studies on larger number of individuals with a long duration follow-up is required to substantiate the findings.^[28]

Effect on EEG waves

The outcome of *Bhramari pranayama* on the autonomic nervous system is quiet indispensable. It increases paroxysmal EEG waves soon after practice in healthy volunteers. During the practice of *Bhramari pranayama*, all the subjects exhibited high frequency hyperphasic patterns, biphasic waves. They have found strong amplitude gamma waves after 30 days of *Bhramari pranayama* practice (two sessions per day) and continuous practice would cause the waves to remain for several minutes even after the practice is finished.^[29]

Effect on Cognitive Functions

Enhanced inhibitory response and cognitive control can be noted among the healthy individuals followed by 10 min of Bhr.P practice. Stop signal task can be used as one of the important tool to assess the response inhibition in cognitive psychology, cognitive neuroscience, and psychopathology. *Bhramari Pranayama* may enhance inhibition response and cognitive control in healthy participants.^[30]

Other effects of *Bhramari Pranayama*

One study revealed that *Bhramari* significantly reduced many symptoms associated with tinnitus, such as depression, irritability and anxiety.^[31] *Bhramari pranayama* may serve as a very cost effective and routinely applicable supporting therapy for individuals having tinnitus that probably acts by harmonizing neurological principles.^[31] *Pranayama* seems to have a significant positive effect on test anxiety and test performance. It could be used as an important technique by students prior to their examinations, to reduce their test anxiety and increase their test performance.^[32]

Humming increases the production of nitric oxide. Humming act as a sonic cleanser and cures the infection of respiratory tract by decreasing the swelling of sinus ostia resulting into better drainage and oxygenation.^[33] Humming exercise also increases the vital capacity. It is estimated that humming increases the endogenous generation of nitric oxide level by 15-fold as compared with the quiet exhalation.^[34] It has been observed that adding tiny

amount of nitric oxide to the oxygen to the premature infants prevents blindness, cerebral palsy, and deafness.^[35]

Practicing strong humming for one hour on daily basis can put an end to chronic rhino sinusitis in four days by stimulation of endogenous nasal nitric oxide production. It may be helpful in preventing coagulopathies and thus decreasing morbidity due to Covid-19. It leads to enhance immune response, physiological healing and over all wellness.^[36]

Bhramari pranayama is efficacious in improving the aerodynamic and acoustic parameters of voice. The results suggests that *Bhramari pranayama* has an effect on voice related acoustic and aerodynamic parameters by significantly improving the maximum phonation duration for all sustained vowels, glottal airflow and pressure and average fundamental frequency, after practicing *Bhramari pranayama*. This indicates that the practice of *Bhramari pranayama* may be helpful in improving the respiratory phonatory coordination and also that with extensive practice one can achieve breathe control.^[37]

Bhramari Pranayama and *Yoga Nidra* if practiced together can significantly alleviate the stress induced changes in cardio-respiratory parameters. Yoga is undoubtedly a trouble-free and cost effective way for reducing damaging effects of stress and if incorporated in our lifestyle yoga can honour us with a long, healthy and disease-free life.^[38]

Integrating regular practicing of *Bhramari pranayama* along with the conventional management of chronic rhinosinusitis is more efficacious than conventional management alone.^[39]

Research suggests that long *Pranayamic* breathing chanting activates the parasympathetic system and by lowering our stress level will definitely increase our confidence level.^[40]

Bhramari Pranayam, releases nitric oxide and when combined with *Kumbhak*, *Greeva Chalan* along with modifying diet and lifestyle can prevent or delay the aging hearing loss. It potentiates immunity and senile degeneration (dementia Alzheimer's) including old age deafness.^[41]

DISCUSSION

There are few influencing scientific bases regarding constant physiological changes produced when *Pranayama* is practiced. Still, there subsists a dearth of literature of clinical efficacy of *Bhramari pranayama* on physiological systems. *Pranayama* is one practice that has been found to be effective to physiology of mankind in many ways.

Prāṇāyāma is one among the important divisions of the ancient traditional Yoga practices. Different types of *Prāṇāyāma* techniques were shown to produce different effects, in which there is lack of consistency in

the results of specific nostril yogic breathing and the mechanisms behind the effects of various *Prāṇāyāma*. Hence, more future studies have to be put forth in the field of *Prāṇāyāma* to explore its precise effect with the underlying mechanisms. *Pranyamas* such as *Savitri*, *Kapalabhati*, *Bhasrika*, *Nadisuddhi* and *Bhramari* cause pronounced physiological responses.

Though various studies have been already done in the past but there is some new concept which is being tried to be added with this article for the purpose of further studies. Very few studies focusing on post menopausal symptoms have been done. In post menopausal women, irritability, mood swings, insomnia, difficulty in concentrating, mental confusion, stress incontinence, depression, headache and vasomotor symptoms occurs. *Bhramari pranayam* would surely be very helpful to combat these conditions and will also be very helpful to prevent women from risk of many upcoming ailments in their future life. *Bhramari* generates vibrations in our brain and causes relief in these symptoms by various mechanisms.

Cortisol that is considered as a major stress hormone causes increased oil production from skin glands, which can finally lead to clogged pores which causes acne breakouts. Prolonged stress leads to sustained increased levels of these hormones and can produce negative effect on your skin health. Practicing *Bhramari pranayama* causes reduction of cortisol level which will effect on stress level and finally it may induce happiness and will surely increase dopamine which will reflect on skin physiology, as it has been told by Acharya charaka in *Indriya upakramniya Adhyaya* "*Twaka cheta samavayi*" seems to be very relatable here. Through which glow in the skin or health of the skin can be increased.

Stress plays a significant role in provoking cardiac arrhythmia by exerting overpowering effects on electrophysiology of the cells of myocardium and the cardiac rhythm. Psychological and physiological stressors influence the cardiovascular system through the autonomic nervous system. There are many studies suggesting reduction of stress by practicing *Bhramari pranayam*. Further studies can be done to check the effect of *Bhramari* on patients having Cardiac arrhythmias.

Due to fear of spreading of Covid 19 infection and lockdown restrictions, large no. of family members are residing in their home resulting in stress related conditions in most of them. *Bhramari pranayama* is very efficient in lowering stress level and should be practiced by everyone in today's scenario. As *Bhramari* can be practiced by every age group without requiring any specific conditions to be practiced and its cost effectiveness, it can be practiced to prevent upcoming consequences of Covid 19 pandemic.

Bhramari pranayam produces acoustic vibration that could have significant impact in producing the desired effect. Since, for other parts of the body we do have stretching exercises, *Yoga asanas* and many other forms but for brain we don't have such practices. In this context *Bhramari pranayam* is good alternative and a unique technique which produces vibration of head and vibration by one's own voice might not be harmful for the brain tissues.

CONCLUSION

From such multiple evidences it can be conclude that *Bhramari* influences multiple systems in the body and it is definitely very relevant in current grievous Covid 19 pandemic as *Bhramari* lowers the stress, produce calmness and enhance tranquility in several ways. There is definitely having scope to have desirable effects on respiratory system, autonomic nervous system, stress, anxiety level and over all emotional status of the practitioner. However there arises a need for focusing on strengthening the methodology and study designs for more reliable and valid result. Due to its high degree of reproducibility, RCTs are accepted universally as a top rated study design. Therefore more RCTs are required in this field to fulfill the dearth literature on the effect of *Bhramari Pranayam* empirically.

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