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Yoga Mudras and Physiological Benefits: A Narrative Review of Their Role in Cardiopulmonary Function

Ahlawat S[1*], Archana K[2], Shetty A[3], Sharma V[4], Vinaya Kumar T[5]

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[1*] Sachin Ahlawat, Post Graduate Scholar, Alva's College of Naturopathy and Yogic Sciences, Moodbidri, Dakshina Kannada, Karnataka, India.

[2] Archana K, Professor, Alva's College of Naturopathy and Yogic Sciences, Moodbidri, Dakshina Kannada, Karnataka, India.

[3] Anuprita Shetty, Assistant Professor, Alva's College of Naturopathy and Yogic Sciences, Moodbidri, Dakshina Kannada, Karnataka, India.

[4] Vijay Sharma, Assistant Professor, Mahala College of Naturopathy and Yogic Sciences, Reengus, Sikar, Rajasthan, India.

[5] Vinaya Kumar T, Post Graduate Scholar, Alva's College of Naturopathy and Yogic Sciences, Moodbidri, Dakshina Kannada, Karnataka, India.

Yoga Mudras, specific hand gestures used in conjunction with pranayama and meditation, are believed to influence physiological functions, particularly those related to the circulatory and respiratory systems. This narrative review explores the impact of mudras on heart rate, blood pressure, and lung function, integrating traditional yogic wisdom with scientific findings. Studies suggest that certain mudras enhance blood circulation, stabilize autonomic nervous system responses, and improve oxygen saturation levels. Evidence also indicates that mudras, when practiced regularly, can aid in stress reduction, contributing to better cardiovascular health. Additionally, research on pranayama with mudras highlights its role in improving peak expiratory flow rate (PEFR) and respiratory efficiency. Although direct studies on mudras are limited, findings from broader Yoga-based interventions support their potential benefits in cardiopulmonary function. This review underscores the need for further high-quality research to establish mudras as a complementary approach in cardiovascular and respiratory health management.

Keywords: Yoga Mudras, Pranayama, Meditation, Heart Rate Regulation, Blood Pressure Stability, Stress Reduction, Cardiovascular Health

Corresponding Author

Sachin Ahlawat, Post Graduate Scholar, , Alva's College of Naturopathy and Yogic Sciences, Moodbidri, Dakshina Kannada, Karnataka, India.
Email: drahlawat97@gmail.com

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Introduction

India has been practicing *Yoga* for thousands of years. It is both a science and a holistic philosophy.**[1]** *Yoga* is a physical, mental, and spiritual integrative exercise that has its roots in ancient India. It is a methodical process for reaching balance and harmony both inside oneself and with the outside environment. The fact that *Yoga* originated in India is indicative of its close ties to the philosophical and spiritual traditions of antiquity. It developed as a way for people to achieve spiritual development, inner peace, and self-realization. Although *Yoga* is mostly recognized for its physical postures, it also incorporates breathing exercises, meditation, self-awareness exercises, and ethical concepts. Fundamentally, *Yoga* seeks to promote general well-being by bringing the body, mind, and spirit together.**[2]** Despite popular belief in the West, yoga is not only physical, but also both physio-psychological and psycho-spiritual. It is a science that liberates the mind from the constraints of the material world and points it in the direction of the soul.**[3]** The Sanskrit word "*Yuj*," which means "to join" or "solidarity," is where the name "*Yoga*" originates. It is described as the joining of personal consciousness with broader awareness.**[4]** The word "*Mudra*" comes from the Sanskrit word "*Mud* + *Dhra*," which means "bliss dissolving," which means something which unites the devotee and the deity and destroys duality. *Mudras* are positions of the hands, body, or eyes that help distinct energy flows through the body. By creating a particular *Mudra*, one can induce particular mental and conscious experiences. According to tradition, *Mudras* are usually employed to guide the flow of energy throughout the body during *Pranayama* and meditation; distinct parts of the hand activate distinct parts of the brain, according to *Yoga* philosophy. By lightly giving pressure on certain hand parts, we will "activate" the associated brain region, much like reflexology. Various emotions, sentiments, and representatives of different states of being are likewise represented by mudras.**[5]** Both *Bandhas* and *Mudras* are included in the *Hatha Yoga Pradipika*. The old tantric writings do not distinguish between the *Mudras* and *Bandha*. In *Pranayama* and *Mudra* practices, *Bandhas* are often used. On the other hand, their locking function makes them a fundamentally significant set of practices in and of themselves.**[6]**

The fundamental idea behind mudras is that energy moves from higher levels to lower levels. Thermodynamics, electricity, electrostatics, magnetism, and atomic and nuclear bonding all make use of this law. The human body is made up of five components: *Jal* (water), *Agni* (fire), *Vayu* (air), *Aakash* (space), *Prithvi* (earth)**[7]** Five fingers represent the five elements: thumb represents fire, index finger represents air, middle finger represents space (ether), ring finger represents earth, and little finger is water.**[8]**

"*Manah Prashamanopayah Yoga Ityabhidhiyate*" (*Yoga* is a means to soothe the mind) is how *Vasista Yoga* describes *Yoga*.**[9]** Similarly, the *Bhagavad Gita* states that "*Samatvam Yoga Uchyate*" (a balanced state of body and mind).**[10]** Mudras work in the body as switches and catalysts to enhance bodily processes. Mudras help people recoup lost vitality and focus their minds. Mudras indicate our mental, physical, and spiritual states of being.**[11]**

Jnana Mudra is the gesture of intuitive understanding since the word "*Jnana*" implies "wisdom" or "knowledge." Conversely, the word chin comes from the word chit or *Chitta*, meaning 'awareness'. Thus, the psychic gesture of consciousness is *Chin Mudra*. The three gunas, or attributes of nature, are symbolically represented by the small ring, and middle fingers: tamas, which means stability; *Rajas*, which mean activity and creativity; and *Sattva*, which means luminosity and harmony. These three states must be transcended for consciousness to move from ignorance to knowing. The thumb denotes supreme consciousness, whereas the index finger stands for individual consciousness, or *Jivatma*. In the *Chin* and *Jnana Mudras*, the individual (index finger) acknowledges the thumb's unrivalled power and bows down to it. But the thumb is being touched by the index finger, signifying the final union of the two experiences and the culmination of *Yoga*.**[12]**

The measurement of the force or pressure of blood within your arteries is called blood pressure.**[13]** Millimetres of mercury, or mm Hg, are used to measure blood pressure. There are two numbers on a blood pressure reading. Systolic pressure, the upper value. A heartbeat's pressure in the arteries is indicated by the upper number, the lower value, or diastolic pressure. The artery pressure between heartbeats is indicated by the bottom number.**[14]**

Often, high blood pressure, also known as the "silent killer," shows no signs. Before you notice any problems, it can harm your brain, kidneys, and heart. Cardiovascular disease is significantly increased by high blood pressure.**[13]**

The blood wave that is produced in an artery during a cardiac cycle by the contraction of the left ventricle is known as the pulse or heart rate. A cardiac contraction's ejection of blood is reflected in the amplitude or strength of the pulse (stroke volume). Adults typically have a pulse rate between 60 and 100 beats per minute.**[15]** Peak expiratory flow rate, or PEFR, is the highest flow rate (measured in litres per minute, or L/min) produced during a hard exhale that begins at full inspiration. The patient's lung recoil, intentional effort, and muscular strength all affect PEFR, which primarily measures big airway flow.**[16]**

The unit of measurement for PEFR is litters per minute (L/min). The patient's age, sex, and height will all affect the anticipated peak expiratory flow rate. A normal reading ranges between 400 and 600 L/min.**[17]**

This review aims to explore how *Yoga Mudras* can impact heart and lung function. By looking at traditional knowledge, scientific theories, and physiological principles, it seeks to understand how specific hand gestures might improve breathing, heart rate, and circulation. The review also highlights the need for further research on using *Mudras* in heart and lung health therapies and modern rehabilitation practices.

Methodology

A comprehensive literature search was conducted across multiple academic databases, including PubMed, PubMed Central, Google Scholar, and other relevant sources. The keywords used for the search included "*Yoga Mudras*," "Physiological Benefits of *Mudras*," "*Mudras* and Cardiopulmonary Function," "Hand Gestures and Respiratory Health" and total of 219 papers reflected in the search. Studies focusing on how mudras affect heart rate, lung function, and circulation were considered. Only 17 papers were selected for this review after application of inclusion and exclusion criteria. However, research was excluded if the abstract was unavailable, if the study was published in a language other than English, or if it was a duplicate or unrelated to *Yoga Mudras*.

Results

Physiological effect of *Mudras* on Circulatory & Respiratory System

The *Yoga* book written by *Swami Niranjanananda Saraswati* titled "*Yoga Darshan*" states that chin *Mudra* slightly stimulates the nerves along the inside of the upper arms, this helps in opening up of lungs and chest cavity. This helps in controlling the thoughts along with the breath.**[18]**

It is said that *Mudras* increase energy and blood circulation to different parts of the brain, to important nerve junctions and glands. Early yogis mapped out the hand areas and their associated reflexes which relate to the different areas of the body and brain.**[19]** Velan Arumugam et. al. (2024) the observations of this study ascertain the improvement in PLR and HRV variables among healthy individuals. This study will also explore high-quality clinical evidence on the potential benefits of *Kaki Mudra* on the sympathovagal balance among healthy participants.**[20]** Sunitha S et al. 2020 By using these yoga *Mudras* (*Apana Vayu Mudras*), we may calm our minds and promote emotional healing. Thus, Mudra Therapy has a highly substantial impact on hypertensive patients' blood pressure levels.**[21]** Though there are least research done on effect of mudras on circulatory system; it found that few researchers included *Mudras* along with other *Asanas* in their protocols showing its effect on the cardiac variables. After 12 weeks of *Yoga's* therapeutic effect against HTN and low-PEFR, a significant increase in SpO2 level was observed, as measured by blood oxygen content or pulse oximetry-SpO2 intervention.**[22]** *Yoga* and oxygen saturation were found to be significantly correlated in a 6-week research of secondary school pupils who practiced *Yogic* breathing, with a mean difference of 5.**[23]** According to the findings, the five minutes of continuous *Yoga Asana* practice dramatically raised oxygen saturation levels.**[24]** After 12 weeks of *Yoga's* therapeutic effect against HTN and low-PEFR, a significant increase in SpO2 level was observed, as measured by blood oxygen content or pulse oximetry-SpO2 intervention.(22) *Yoga* and oxygen saturation were found to be significantly correlated in a 6-week research of secondary school pupils who practiced *Yogic* breathing, with a mean difference of 5.(23) According to the findings,

The five minutes of continuous *Yoga Asana* practice dramatically raised oxygen saturation levels.**[24]** After practicing *Yoga* for a month, the systolic and diastolic blood pressure of healthy subjects considerably dropped. It is possible to determine what is causing this variation in autonomic activity, which favours the parasympathetic nervous system over the sympathetic nervous system.**[25]** The experimental group's mean SBP and DBP readings considerably decreased after completing a 6-week yoga program, indicating the efficacy of *Yoga* as a blood pressure-controlling strategy.**[24]**

SBP and DBP significantly decreased during the course of a three-month *Yoga Pranayama* study conducted by Vungarala Satyanand et al. One essential autonomic function that may be consciously controlled is breathing, which influences the involuntary nervous system and helps to balance the sympathetic and parasympathetic nervous systems.**[26]** Patients with hypertension saw a reduction in their systolic blood pressure from 154.53 mmHg to 133.2 mmHg and their diastolic blood pressure from 93.8 mmHg to 82.26 mmHg following ten days of pranayama practice.**[27]** *Yogic Mudras* can help athletes' neuromuscular coordination by controlling physiological systems, lowering stress levels, and improving mental focus. **[28]** This study explored the long-term link between perceived stress impact on health and CHD risk. Over 18 years, participants who believed stress significantly harmed their health faced a higher risk of coronary death and heart attacks.**[29]** Thus *Mudras* proved to reduce the stress level which enhance the cardiovascular functions.

Pranayama practice led to a decrease in respiratory rate. By increasing the lungs' overall capacity, *Pranayama* improves their ventilation efficiency. This enhanced lung fun-ction ensures optimal energy flow, supporting the body's homeostasis and aiding in the prevention, management, and treatment of various respiratory disorders.**[30]** A study conducted on hypertension patients over 40 days of *Pranayamas* practice demonstrated a positive effect on respiratory rate. Post *Pranayama*, the respiratory rate significantly decreased from 15.33 ± 1.49 to 12.83 ± 1.01 breaths per minute.

Yoga breathing positively influences PEFR. A study by Budhi et al. found that health-y individuals who practiced *Bhastrika Pranayama* for a month experienced a significant increase in PEFR.**[31]**

Dinesh T's study found that pranayama positively impacts pulmonary function tests. After a 12week intervention, healthy volunteers experienced significant improvements in their Peak Expiratory Flow Rate.**[32]**

Conclusion

Yoga Mudras, deeply rooted in ancient traditions, offer a simple yet powerful way to influence physiological functions, particularly those related to the heart and lungs. While scientific studies on mudras alone are still limited, existing research on *Yoga* and *Pranayama* suggests their potential benefits in regulating blood pressure, improving oxygen levels, and enhancing respiratory efficiency. By promoting relaxation and reducing stress, *Mudras* may indirectly support cardiovascular health and autonomic balance. Given their accessibility and ease of practice, integrating *Mudras* into holistic wellness approaches could be beneficial. However, more focused studies are needed to fully understand their mechanisms and establish their role in modern healthcare.

Future Scope

Yoga mudras hold great potential for further exploration in improving cardiovascular and respiratory health. Future research can focus on:

- Conducting large, well-controlled clinical trials to confirm the specific benefits of different mudras.
- Examining how mudras affect the autonomic nervous system, blood pressure, and lung function over time.
- Using advanced imaging and biofeedback tools to understand the brain-body connection behind mudra practices.
- Incorporating mudras into treatment plans for conditions like hypertension, chronic respiratory issues, and stress-related problems.
- Creating clear guidelines for using *Mudras* as part of modern healthcare practices.

Limitations

Despite encouraging signs, some challenges remain:

- Limited scientific research specifically on *Mudras*, with most studies focusing on broader *Yoga*
- Individual responses to *Mudras* vary, making it hard to draw general conclusions.

- There's a lack of standardized methods for practicing and measuring *Mudras*'
- It's tough to isolate the effects of mudras from other *Yoga* techniques like postures and breathing exercises.
- More objective, evidence-based research is needed to confirm the traditional claims about *Mudras*.

By addressing these challenges through more focused research, *Mudras* could be better understood and potentially integrated into mainstream health practices.

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