Original Article

Effect of Jnana and Chin Mudras on Cardio-Pulmonary Variables among Healthy Individuals: A Single Arm Study

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ABSTRACT

Mudras, specific hand, body, or eye positions, facilitate unique energy flows within the body, fostering distinct mental and conscious experiences. They enhance vitality, focus the mind, and reduce tension, and notably, calm thoughts. This study aims to evaluate the effects of Jnana mudra and Chin mudra on healthy individuals using cardiopulmonary variables. The study included 120 healthy participants, both male and female, aged 18 to 25. Pre- and post-intervention assessments were recorded, measuring systolic and diastolic blood pressure (SBP, DBP), pulse rate (PR), respiratory rate (RR), oxygen saturation (SpO2), and peak expiratory flow rate (PEFR) using a peak flow meter, cardiac monitor, and pulse oximeter. Mudras were practised for six days a week for eight weeks, followed by the post assessment. Significant decreases were observed in systolic blood pressure ($p \leq 0.001$), diastolic blood pressure ($p \leq 0.001$), respiratory rate ($p \leq 0.001$), and pulse rate ($p \leq 0.001$). There were also notable improvements in peak expiratory flow rate ($p \leq 0.001$) and SpO2 levels ($p \leq 0.001$). Gender-specific comparisons revealed significant changes in diastolic blood pressure ($p \leq 0.001$), respiratory rate ($p=0.01$), peak expiratory flow rate ($p \leq 0.001$), and oxygen saturation ($p=0.002$). These findings demonstrate the positive impact of mudras on overall cardiopulmonary health, suggesting that regular practice can enhance fitness and health outcomes.

Key words: Chin mudra, Jnana mudra, cardiopulmonary, SpO2, blood pressure, pulse rate, respiratory rate, PEFR

India has been practicing yoga dating back to thousand 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 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.

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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 that 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. Yoga philosophy states that distinct parts of the hand activate distinct parts of the brain. 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. Reflecting bandhas being used in pranayama and mudra practices. On the other hand, their locking function makes them a fundamentally significant set of practices in and of themselves [6]. The fundamental idea

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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 comprises five components: Jal (water), Agni (fire), Vayu (air), Aakash (space), and Prithvi (earth) [7]. Five fingers represent the five elements: the thumb represents fire, the index finger represents air, the middle finger represents space (ether), the ring finger represents earth, and the little finger is water [8]. 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 [9].

Jnana mudra represents the gesture for intuitive understanding, as "jnana" implies "wisdom" or "knowledge". Conversely, the word “chin” originates from chit or Chitta, meaning “awareness” thus, chin mudra is a psychic gesture for consciousness. The attributes of nature described as the three gunas, are symbolically represented by the small, ring, and middle fingers: tamas, which means stability; rajas meaning creativeness and activity; and sattva depicting luminosity and harmony. Enabling the transcend of the three stages is required for consciousness to transform ignorance into knowing. The thumb denotes supreme consciousness, whereas the index finger holds the individual’s consciousness, or jivatma. In the chin and jnana mudras, the individual (index finger) acknowledges the thumb's unrivaled 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 [10].

This study aimed to assess and evaluate the effect of Jnana mudra and Chin mudra on selected cardiopulmonary variables including systolic and diastolic blood pressure (SBP, DBP), pulse rate (PR), respiratory rate (RR), oxygen saturation (SpO2), and peak expiratory flow rate (PEFR) among healthy individuals.

MATERIALS AND METHODS

The current study was a randomized controlled trial carried out in the Department of Clinical yoga at Alvas’s College of Naturopathy and Yogic Sciences it involved screening of 200 healthy subjects. 120 subjects between the age group of 18-25 years were recruited after taking informed consent. No control group was included. Subjects who underwent any yogic practices for last 3 months and any pre- diagnosed clinical illness were excluded. Outcome variables of this study consists of Blood pressure including Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) will be recorded using Automatic non-invasive patient cardiac monitor EFFICA CM10 a Philips model, Manufactured by PHILIPS MEDICAL SYSTEM, MA01810 USA. Pulse rate and respiratory rate will be recorded using automatic non-invasive patient cardiac monitor EFFICA CM10 a Philips model, Manufactured by PHILIPS MEDICAL SYSTEM, MA01810 USA [11].

Oxygen saturation will be measured using a Nellcor N-20 pulse oximeter. Fingers will be designated as a preferred site for pulse oximetry measurement [12]. Peak expiratory flow rate will be measured by using mini wright peak flow meter (obtained from clement Clarke international Ltd, U.K). First, the patient should reset the meter by sliding the marker all the way to zero on the scale. While sitting or standing up straight, the patient should take in a full, deep breath. The mouthpiece is then placed in the patient’s mouth followed by a single, fast, forceful expiration. The marker will slide outward on the numbered scale, indicating the peak expiratory flow rate for that attempt. Using the best reading from several repeated attempts is recommended [13]. Ethical clearance was obtained from the institutional committee (figure 3)

CTRI Registration - CTRI/2024/07/071729

Intervention

1. Sitting in Sukhasana with eyes closed for 30 sec.
2. Followed by Jnana mudra and Chin mudra for 15 minutes [14] twice a day for 8 weeks.

Jnana mudra (psychic gesture of knowledge) Fold the index finger so that they touch the inside root of the thumb. The remaining fingers are relaxed but straight, the hands place on the knees and palm facing the ground. (Figure 1).

Chin mudra (psychic gesture of consciousness) a. Fold the index finger so that they touch the inside root of the thumb. b. In the receiving pose, it is essential that the palm-side of your hands face upwards. c. Extend the last three fingers of your hands and relax the hands and arms on knees. (Figure 2) [10].

Statistical analysis

120 subjects, 60 male of age (21.38±1.12 years) and 60 females of age (21.60±1.21 years) were recruited in the study. The data was visually inspected for manual errors and the data was analysed using SPSS version 15.0. Univariate analysis of variance was performed to see within group changes and also changes across the gender after controlling for Age. All the parameters satisfied the criteria for Levene’s test for equality of variance. Bonferroni’s correction for multiple testing was made.

RESULTS

There was a significant reduction in systolic blood pressure [$F(2,117)=474.94$, $p\leq0.001$, $p\eta^2=0.80$], diastolic blood pressure [$F(2,117)=689.40$, $p\leq0.001$, $p\eta^2=0.86$], Respiratory rate [$F(2,117)=343.72$, $p\leq0.001$, $p\eta^2=0.75$], Pulse Rate [$F(2,117)=989.70$, $p\leq0.001$, $p\eta^2=0.89$],. Significant improvements in Peak Expiratory Flow Rate [$F(2,117)=3644.24$, $p\leq0.001$, $p\eta^2=0.97$], SpO2 [$F(2,117)=95.35$, $p\leq0.001$, $p\eta^2=0.50$] (Table 1) (Figure 4).

Gender wise comparison showed significant change in Diastolic blood pressure [$F(2,117)=9.64$, $p\leq0.001$, $p\eta^2=0.08$],

Respiratory rate [$F(2,117)=6.88$, $p=0.01$, $p\eta^2=0.06$], Peak Expiratory Flow Rate [$F(2,117)=6.31$, $p\leq0.001$, $p\eta^2=0.05$] and SpO2 [$F(2,117)=10.21$, $p=0.002$, $p\eta^2=0.08$]. (Table 2) (Figure 5) (Figure 6).

Table 1: Representing group averages before and after the intervention

Variable	Pre	Post	p-value	$p\eta^2$
Systolic Blood Pressure	116.75±6.096	116.03±5.194	p≤0.001	0.80
Diastolic Blood Pressure	72.47±7.551	72.58±7.373	p≤0.001	0.86
Respiratory Rate	16.38±1.879	16.5±1.577	p≤0.001	0.75
Pulse Rate	75.82±5.815	76.03±5.014	p≤0.001	0.89
Peak Expiratory Flow Rate	364.25±75.467	367.42±74.354	p≤0.001	0.97
SpO2	97.16±1.316	98.13±1.185	p≤0.001	0.50

Table 2: Representing gender-wise values comparisons before and after the intervention

Variable	Male		Female		p-Value	$p\eta^2$
	Pre	Post	Pre	Post		
Age	21.38±1.12		21.6±1.21			
Systolic Blood Pressure	116.63±6.98	115.9±6.19	116.87±5.12	116.17±4.01	P=0.80	≤0.001
Diastolic Blood Pressure	70.97±6.68	70.47±5.82	73.97±8.11	74.68±8.17	p≤0.001	0.08
Respiratory Rate	16.85±1.69	16.65±1.471	15.92±1.95	16.35±1.68	p=0.01	0.06
Pulse Rate	75.67±5.88	75.8±5.045	75.97±5.79	76.27±5.02	P=0.46	0.005
Peak Expiratory Flow Rate	411.33±69.27	415.17±66.29	317.17±46.69	319.67±46.03	p≤0.001	0.05
SpO2	97.32±1.13	98.47±0.65	97±1.47	97.78±1.47	p=0.002	0.08

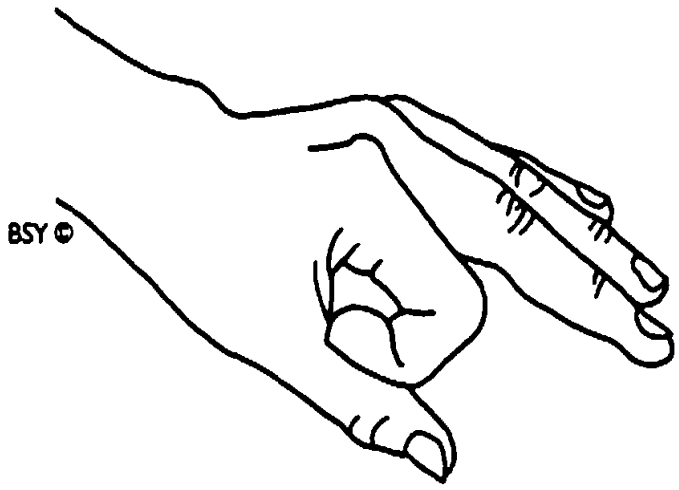

Figure 1: Jnana mudra

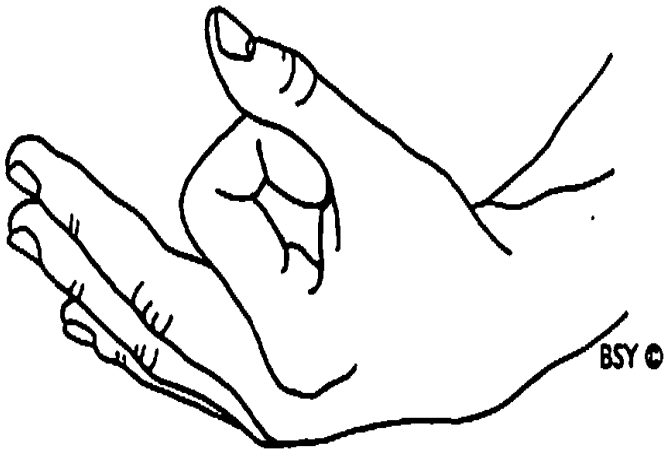

Figure 2: Chin mudra

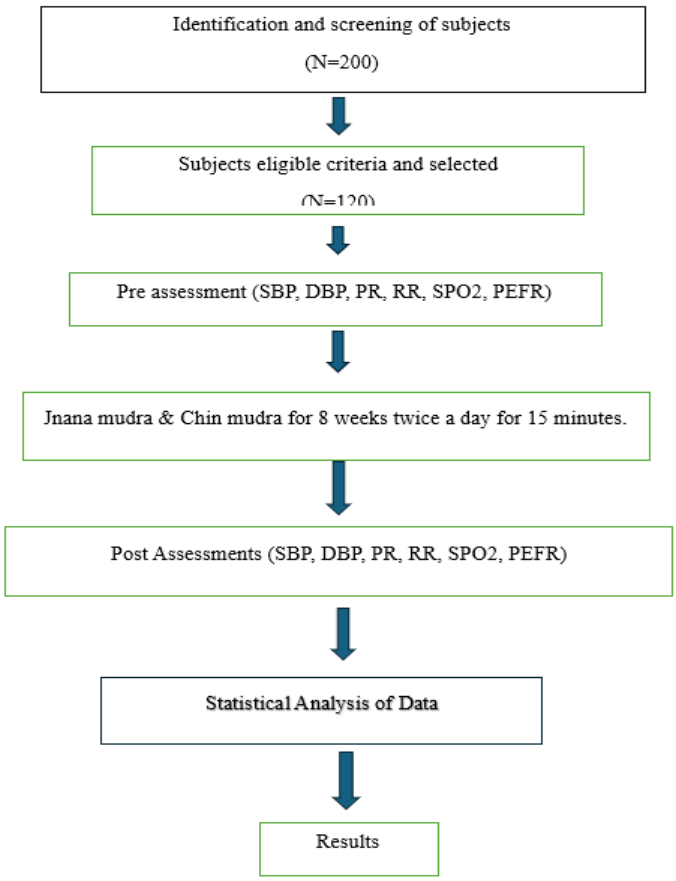

Figure 3: study plan

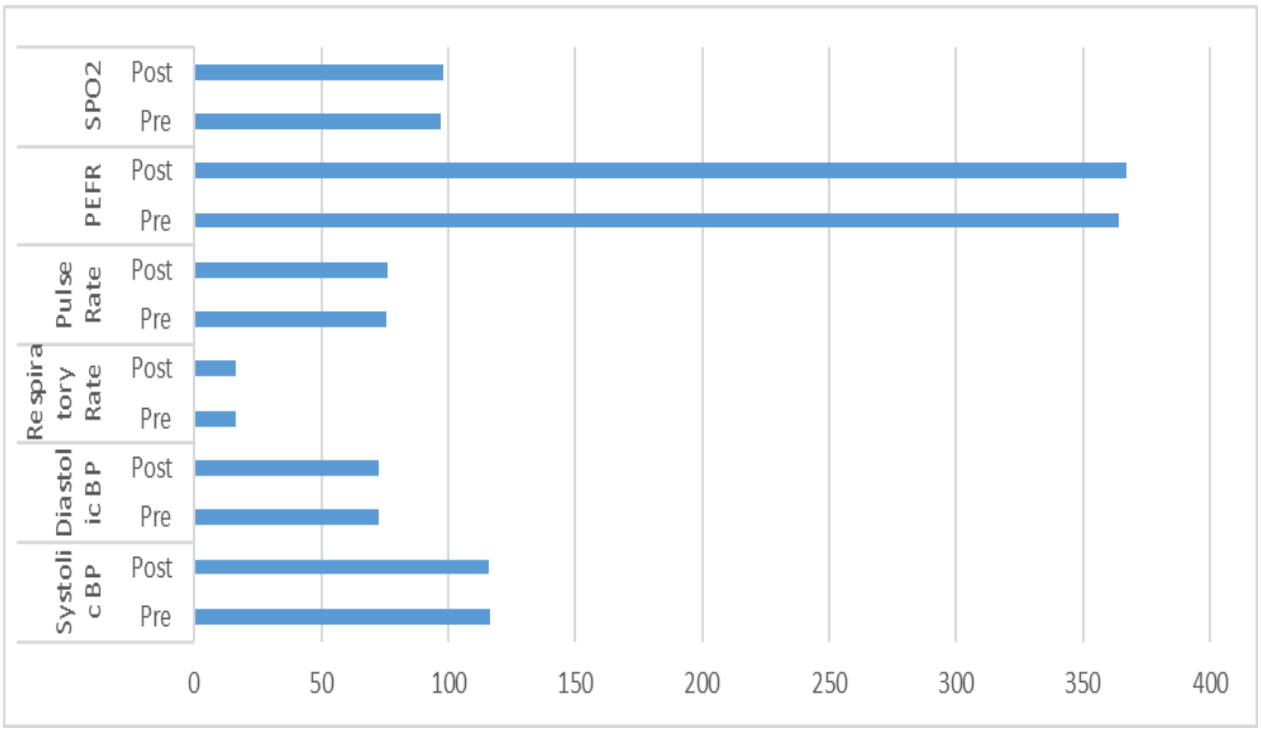

Figure 4: Graphical representation group averages before and after the intervention

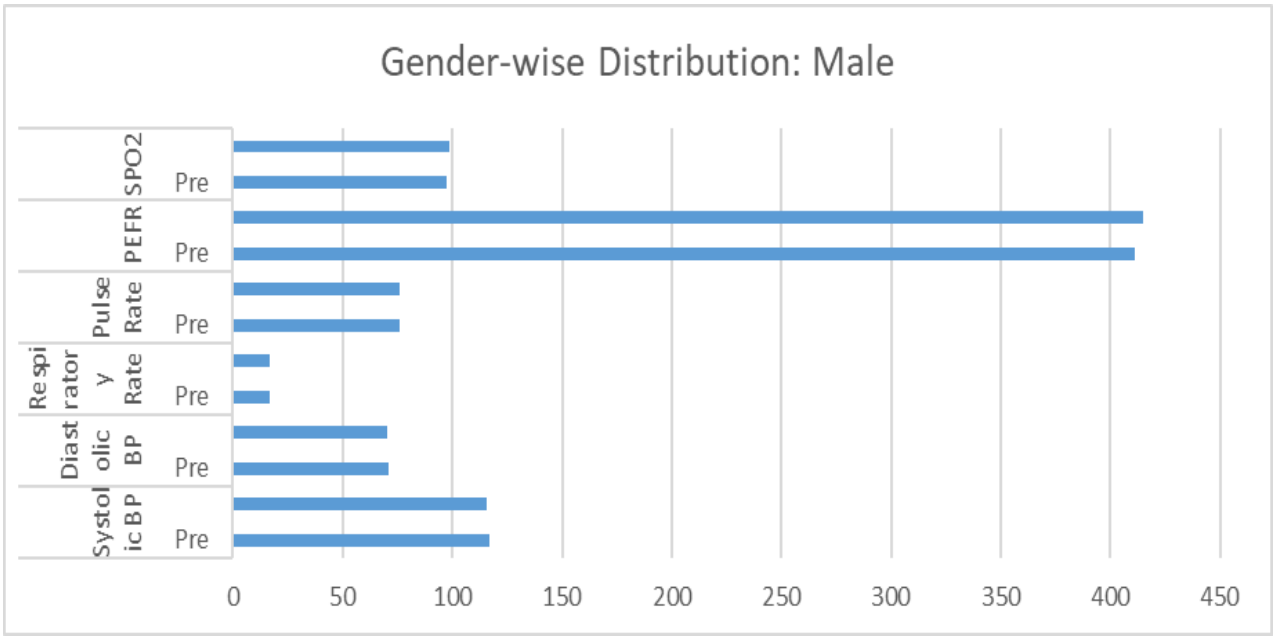

Figure 5: Graphical representation Gender-wise distribution: Male

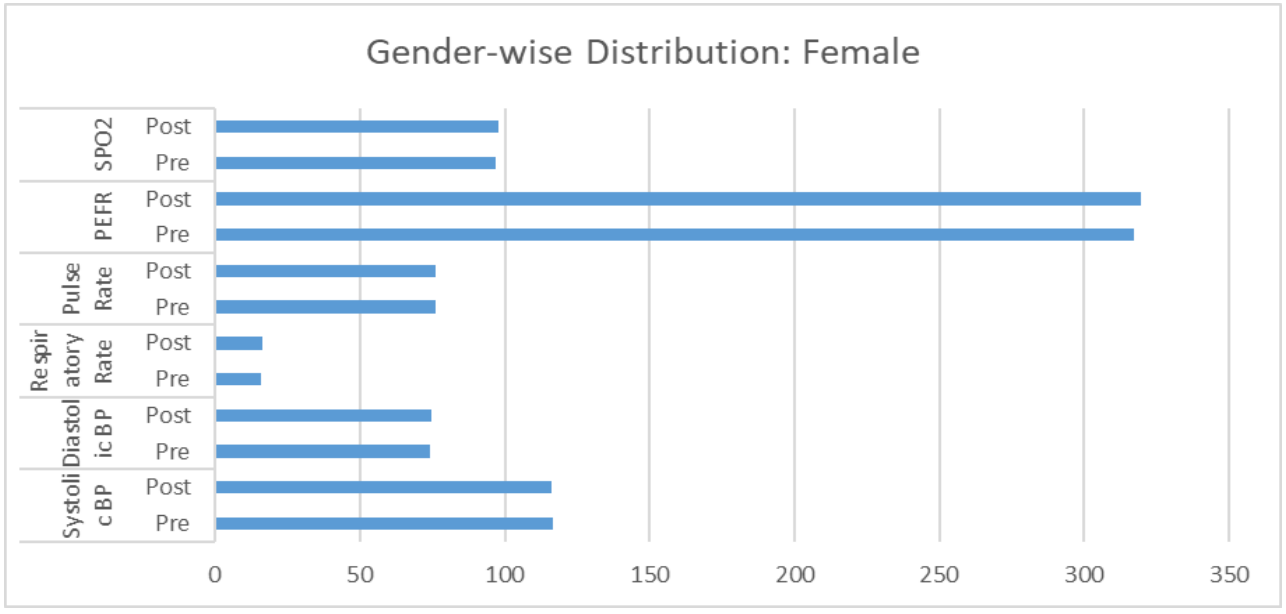

Figure 6: Graphical representation Gender-wise distribution: Female

DISCUSSION

Mechanisms of action of nervous system the neuro-hormonal axis play a crucial role in overseeing and regulating human physiology. The nervous system, in conjunction with the hormonal system, ensures the proper functioning and coordination of bodily processes. For the body to maintain homeostasis, the neuro-hormonal axis and organ systems must work harmoniously, and here is where yoga shines. By targeting both specific organ systems and the intricate neuro-hormonal network, yoga guides the body toward the needed equilibrium for a healthy life. When combined with medications, specific yoga postures, breathing exercises, yoga hand mudras, and a balanced lifestyle, one can achieve faster recovery and prevent further complications in various diseases. In essence, yoga acts as a powerful adjunct in managing and improving overall health [1]. Mudras are thought to function by activating specific energy channels in the body called Nadis, and redirecting the flow of prana, or life force energy [15].

This subtle energy manipulation is believed to have a profound impact on the autonomic nervous system, which controls involuntary bodily functions such as heart rate, blood pressure, digestion, and breathing [16]. An article on Mudra

therapy and its classification published in the International Journal of Health Sciences and Research indicated that mudras can connect the nervous system, stimulate energy pathways, and enhance blood circulation. This helps manage stress, depression, and anxiety, ultimately improving mental health [17, 18]. Based on neuroanatomical studies, the effectiveness of these mudras can be attributed to their impact on the nerve endings in the fingers and palms. The interplay of the fingers in these mudras sensitizes the nerves in the palm and wrist area. This pressure on the nerves has a systemic effect on cardiovascular parameters through the peripheral nerves and specific areas of the brain. The reduction in heart rate and blood pressure indicates a shift towards parasympathetic activity, which is part of the autonomic nervous system. This shift may be driven by the conditioning effect of the yoga hand mudras on autonomic functions [19].

Apart from the direct effects of the mudras, the autonomic nervous system may have been altered by the practice of focused attention and regulated breathing (deep and slow) during mudra practice [20]. Regulations of the autonomic nervous system by these mudras could have significant clinical implications. The conditioning effect on both the peripheral nervous system and higher areas of the central nervous system can help stabilize physiological conditions, potentially saving lives in critical situations until further medical help is available. Clinical Implications Beyond emergencies, regular practice of these mudras in healthy individuals can lead to a healthier heart, stronger brain, and sharper memory. This aligns with previous studies supporting the therapeutic benefits of mudras. Chin Mudra and Jnana Mudra offer substantial cardiopulmonary benefits and present a valuable addition to conventional therapies for respiratory and cardiac conditions. They hold promise as a part of a holistic approach to health, contributing to global efforts in managing cardiopulmonary health challenges.

Limitations and futures

The major drawback of this study was from the consideration of healthy individuals as subjects. The study was not compared to the similar effects on any control population and the sample size was very small. The study has been done in healthy individuals which shown significance. Future research should explore the long-term effects of these practices on individuals with specific health conditions such as hypertension. Higher-level assessments, like Heart Rate Variability, could provide more detailed insights into the physiological changes induced by these mudras.

CONCLUSION

The present study concluded that practice of chin mudra and jnana mudra for 8 weeks will significantly improved SpO2 and PEFR, also reducing pulse rate, systolic blood pressure, and diastolic blood pressure, Respiratory rate and pulse rate in healthy individuals. Thus suggesting that practice of thus mudras is highly effective on cardiopulmonary function also, highlighting the therapeutic benefits of mudras. Incorporating yogic mudras into one's lifestyle is an essential component of maintaining health due to their accessibility, safety, and affordability. This ancient practice is gaining popularity in clinical settings and can be recommended as an adjunct or alternative therapy for respiratory and cardiac illnesses. Asana, pranayama, and mudras have the potential to help nations tackle global health challenges by preventing cardiopulmonary issues and promoting overall wellness

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