

Impact of Pranayama on Lifestyle Disorder

Chandrika Varna

Research Scholar, Yoga University of Americas, Bengaluru

Abstract - Lifestyle disorders are diseases primarily caused by unhealthy habits such as poor diet, physical inactivity, stress, substance use, and irregular sleep patterns, leading to conditions like diabetes, hypertension, obesity, and cardiovascular diseases. Hypertension is the result of stress, autonomic imbalance, and mental agitation.

Pranayama is a systematic control of breath to regulate prana and calm the mind. Pranayama can also be defined as the expansion of prana (vital energy) by expansion of breath. Pranayama like Anulom-Vilom, Udgeeth, Bhramari, and Pranav helps to reduce stress and calm down the mind, which helps to regulate blood pressure and heart rate naturally and holistically.

Aims of the study:

The present study has been carried-out to assess the effect of pranayama on patients suffering from hypertension.

Methodology:

A sample group of ten (10) people between 50 and 75 was identified in an apartment complex. Demographic and health data were collected using the interview. The pranayama was performed under the supervision of the investigator for 40 minutes daily for 30 days.

Results:

The assessment of data collected shows that there is a change of mean systolic blood pressure of the group to the tune of 33 mmHg and mean diastolic blood pressure of 12 mmHg in a span of 30 days. Application of paired t-test for systolic and diastolic blood pressure Before and After Pranayama shows P value which is less than 0.05. Therefore, the effect of Pranayama on blood pressure is highly significant.

Conclusion:

Combination of Modern medicines and complementary practices of Pranayama is effective in reducing the blood pressure, pulse rate and respiratory rate among patients suffering with hypertension. Yama, Niyama along with positive mental state of mind helps to manage and reverse the hypertension. Regular practice is the key for maintaining good health.

Keywords: Prana, Pranayama, hypertension, Anulom-Vilom, Udgeeth, Bhramari, Pranav

1. Introduction:

Lifestyle disorders are diseases that develop mainly due to unhealthy habits and ways of living, such as poor diet, lack of physical activity, stress, smoking, alcohol use, and irregular sleep patterns. Common lifestyle disorders include diabetes, hypertension, heart disease, obesity, and thyroid disorders.

Hypertension, commonly known as high blood pressure in which the pressure of blood in the arteries remains persistently high. It has emerged as a major global health concern, often called the "silent killer". It usually shows no symptoms until serious complications such as heart attack or stroke occur. Hypertension is a leading risk factor for cardiovascular diseases, kidney disease, vision loss, dementia and contributes significantly to global mortality. Its causes are multifactorial, involving genetic, environmental, and lifestyle factors. Primary hypertension, which accounts for most cases, is associated with risk factors such as age, family history, ethnicity, and gender.[5]

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Hypertension tends to develop gradually due to plaque formation in the arteries called atherosclerosis, which is called **primary (essential) hypertension**. In some cases, high blood pressure occurs due to specific conditions such as kidney or hormonal disorders, which is known as **secondary hypertension**. One can manage hypertension by modifying lifestyle, and on the other hand, due to aging and genetic history, there is always a risk of having hypertension. [6]

Blood pressure is measured in terms of millimeters of mercury (mm Hg). The typical values of blood pressure are:

Normal BP: 120/80	High BP: 140/90	Severe BP: 180/120	Low BP: 90/60
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Most people with high blood pressure have no symptoms, even when blood pressure levels are very high, and may live with it for years without knowing. Some people may experience headaches, shortness of breath, or nosebleeds, but these usually appear only when blood pressure becomes severe or life-threatening.

Maintaining flexible arteries and a healthy heart muscle is important for long life. Atherosclerosis reduces blood flow in small vessels and increases resistance in the arteries, which makes the heart work harder and raises blood pressure. Stress can also increase blood pressure by causing sudden narrowing of blood vessels due to adrenaline release. In simple terms, the main causes of hypertension are stress, unhealthy diet, lack of exercise, and poor relaxation.[8]

Drugs used to treat **high blood pressure** include diuretics, beta-blockers, ACE inhibitors, angiotensin II receptor blockers (ARBs), calcium channel blockers, and other antihypertensive medications, chosen based on the patient's condition and response to treatment.[7]

Managing hypertension usually involves both medication and lifestyle changes, such as using blood-pressure-lowering drugs, following a healthy diet like DASH(**Dietary Approaches to Stop Hypertension**), engaging in regular physical activity, maintaining a healthy weight, and reducing stress through practices such as meditation, breathing exercises, and yoga.[7]

Yoga is the holistic ancient Indian science which helps to balance the physical, mental, emotional and spiritual dimensions of an individual. Breath control is the basis of all yoga practices. Sage Patanjali's Asthanga Yoga is an eightfold path of yoga described in the Yoga Sutras, namely, Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana, Samadhi. Pranayama is the fourth limb of Asthanga Yoga.[1]

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tasmin-sati-śvāsa-prāśvāsayorgati-vicchedaḥ prāṇāyāmaḥ ||49||

(*Patanjali yogasutra 2.49*) to cut the speed of inhalation and exhalation is pranayama. "Pranayama is the regulation or cessation of the movement of inhalation and exhalation, when the posture is firmly established." [3]

Pranayama is conscious, regulated intentional breathing using skeletal and muscular system with total dedication and concentration to get desired result of physical and mental harmony. The practice of Pranayama helps to improve efficiency of lungs, improves immunity and functioning of the entire body. [2]

Breath is the medium of **pranayama** and consists of three stages: inhalation (*pūraka*), retention (*kumbhaka*), and exhalation (*recaka*). Among these, *kumbhaka* plays a key role in pranayama practice, as it allows increased time for the exchange of oxygen and carbon dioxide at the cellular level, thereby facilitating greater assimilation of **prana**. [4] Pranayama starts with conscious breathing and gradually leads to a natural pause of breath, creating deep calmness and inner awareness.[8] By working with one's own prana, a person can improve vitality, willpower, and strength, help in healing diseases, enhance efficiency and abilities, and progress toward higher levels of consciousness.[4]

Pranayama plays an important role in managing hypertension by calming the mind and reducing stress. It helps balance the nervous and hormonal systems and increases parasympathetic (relaxation) activity. This relaxes the blood vessels, reduces

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resistance, and lowers blood pressure. Slow deep breathing, Anulom-Vilom, Udgeeth (Om chanting), and Bhramari and Pranava are especially helpful. These practices can be done for about 40 minutes in one stretch or can be divided into two or three times a day, for best results.[8]

In my study, participants were told to practice Anulom-Vilom 15 minutes, Bhramari 10 rounds, Udgeeth 15 minutes and Pranava Pranayama for 10 minutes.

Participants were asked to practice deep breathing with awareness on throat region for few rounds as a warm up before starting pranayama practices.

Pre-Requisite to do Pranayama:

1. Time should be either early morning or evening in an empty stomach
2. Place should be clean, moderately illuminated and ventilated at room temperature.
3. Posture either sukhasan or on chair with lower back and neck straight on the mat.[2]
 - a) **Anulom-Vilom** is derived from Sanskrit words 'Anu' means with and Viloma means opposite. It is popularly called as Alternative Nostril Breathing in English. Anulom-Vilom works on the principles of Boyles's law, Henry's law, Bernoulli's effect and law of Psychology. Sit comfortably, use thumb to close right nostril, use any two finger combination to close left nostril alternatively. Close right nostril with the thumb and start inhaling from the lung till your lung capacity and now close left nostril by any two finger combination and exhale from the right nostril, immediately inhale from the right and by closing right nostril exhale from the left. This becomes one round of Anulom-Vilom pranayama. The ratio of inhalation to exhalation is 1:2. Practice for long duration for better benefits. In this study subjects were asked to practice for 15 minutes. Improves blood circulation, enhances NO(Nitric Oxide), reduces stress, helps for target delivery of oxygen, balances autonomic nervous system.[2]
 - b) **Bhramari** works on the principle of sound vibration. This pranayama involves breathing deeply through both nostrils with closed eyes and ears with Shanmukhi Mudra and extended longer breath out through both nostrils by making the sound of humming from the throat region. In this study subjects were asked to practice for 10 rounds.[2] Simple Bhramari technique is useful in hypertension, ischemic heart diseases, helps to restore sleep mechanism, helps in chronic sinusitis, rhinitis.[8]
 - c) **Udgeeth(Om Chanting)** works on the principles of Newton's first law of motion and sound vibration. It involves deep inhalation through both the nostrils and extended exhalation through the small aperture of the mouth producing the sound OM. The ratio of inhalation to exhalation shall be 1:3 with 2/3rd portion of exhalation should be Okara followed by Makara for the remaining duration. In this study subjects were asked to practice for 15 minutes.[2] Udgeeth Pranayama is useful in hypertension, insomnia, relieves anxiety, tension, anger, improves digestion, cures acidity. This Pranayama helps to take one to meditation quickly.[2]
 - d) **Pranav(Dhyana):** This pranayama is the last one to practice which involves observing natural breathing technique. In this study subjects were asked to practice for 10 minutes. It improves blood pressure, ensures oxy-rich blood to overall body, enhances mental focus and clarity.[2]

Subjects were taught above breathing techniques before starting the experiment.

2. Methodology:

In this study, ten participants with hypertension, along with a few other associated ailments, were selected. Demographic data was collected from all the participants. They were instructed in the practice of Anulom-Vilom, Bhramari, Udgeeth and Pranav Pranayama for three days. Subsequently, they were asked to continue the practices under supervision. The above Pranayama techniques were modified according to the physical condition and health status of the participants.

The experiences of the participants were systematically recorded. The feedback reported by the participants included a feeling

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of lightness in the body, increased energy levels, reduction in gastric discomfort, decrease in body pain, and a sense of mental calmness. The participants were advised to continue the regular practice of Pranayama to achieve further health benefits and to prevent the progression of hypertension along with other associated health issues.

3. Limitations and Delimitations:

a. Limitations

For research study, one may not get enough number of subjects within the age group for arriving at a definite conclusion and may need to enlarge the scope of study. Patients in the study group should follow the prescribed procedure and method for practice of Pranayama. They need to visit doctor or pathology labs to record the blood pressure and maintain the details with them at frequent intervals to keep track of the changes in blood pressure.

Therefore, cooperation of patients and their discipline to follow instructions and continue their practice along with prescribed medications is key to success of this research. Patients are not advised to stop or reduce their medicines without the advice of doctors.

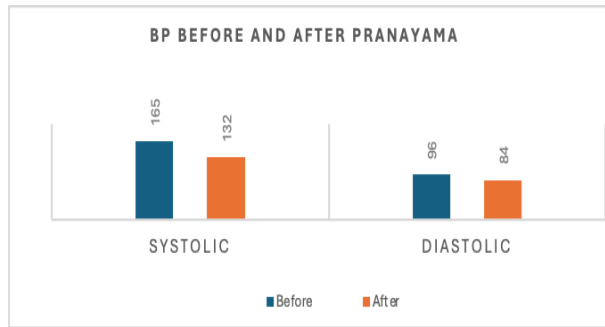
b. Delimitation:

In order to focus the research, study was concentrated on people between 40 to 70/80 age group and specifically excluded any persons who are not capable of sitting and practicing pranayama or stage 3 hypertension patients. Study has been carried out for a brief period of 30 days. Research is limited to persons with middle class background and specifically does not cover lower middle class or people engaged in manual labour or upwardly mobile people who have access to other avenues.

4. Conclusion

The following results are discussed after one month of practice.

Parameter	Before Pranayama		After Pranayama	
	Systolic	Diastolic	Systolic	Diastolic
Average	165	96	132	84
Median	162	95	130	85
Std deviation	20.00	11.97	8.62	2.80
SEM	6.32	3.79	2.73	0.89
P value (Sys)	2.50037E-05			
P Value (Dia)	0.00448839			



Mean score of blood pressure: Before and after pranayama

The assessment of data collected shows that there is a change of mean systolic blood pressure of the group to the tune of 33 mmHg and mean diastolic blood pressure of 12 mmHg in a span of 30 days. Application of paired t-test for systolic and diastolic blood pressure Before and After Pranayama shows P value which is less than 0.05. Therefore, the effect of Pranayama on blood pressure is highly significant. This study is limited to ten people; it must be conducted for large numbers and for long term to check long term impact of Pranayama. Pranayama must be practiced for prevention first and then for management of lifestyle disorders. Pranayama shall be supported by adherence to Yama, Niyama as prescribed in Yoga sutras of Patanjali to realize benefits. As Yoga sutras are universal in nature and not confined to any one religion, it is highly recommended to include them in curricula at young age so that children become aware on techniques available to combat ills of modern fast-paced life and lead a balanced life.

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