**EFFECT OF PRANAYAMA ON STRESS OF**

**SENIOR CITIZENS**

Manorama Panigrahi¹, Research Scholar, Sri Sri University

Paresh Kumar Mishra²,Research Scholar, Sri Sri University

Dr. Prativa Shree³,Asst. Professor, Sri Sri University

Dr. Dinesh Prasad Swain ,Asst. Professor,Sri Sri University

**ABSTRACT**

**Background:** The population of the planet is ageing quickly. More than 20% of persons 60 and older have a mental or neurological condition. Stress, depression, and anxiety disorders are the most prevalent mental and neurological conditions in this age group, affecting 5% to 7% of the global older population. Numerous aging-related health issues, including hypertension, diabetes, and arthritis, have been linked to stress. The most efficient and reliable strategy for managing and controlling stress without the use of drugs is the yogic lifestyle. Among the eight limbs of yoga, *pranayama* is a special method for reducing stress in elderly people and helping them recover from a variety of physio-psychological diseases..

**Aim and objective of study:** The objective of the study was to study the effect of pranayama on stress of senior citizens.

**Material and methods:**

At Satyam Yoga Academyin Bhubaneswar, Odisha, India, the study was carried out by the researcher. The researcher persuaded 45 older people, ranging in age from 60 to 75, to participate in my study. They had given their consent in writing to participate regularly in the study. In the beginning all the participants undertook a 5-day *prānāyama*, meditation practise session along with under the guidance of a yoga teacher from the centre after taking their baseline measurements. After that, the participants routinely practised *prānāyama* and meditation for 15 minutes each morning at 6.30AM for 60 days in the centre. The participants also did some mantra chanting and loosening exercise prior to *prānāyama* and meditation practice. They were instructed to lead regular lives while taking their medications as prescribed and to maintain a healthy eating pattern. The perceived stress scale-14 questionnaire was used to evaluate stress before and after practice

**Results:** The Stress level showed significantly decrease after practice of *prānāyama* for 60 days. Though the blood pressure value showed a downward trend, but it does not show much significant in comparison to stress and anxiety level score**.**

**Conclusion**: Practice of *prānāyama* regularly by the elderly personnel reduces the stress and leads to calmness in life.

**Key word:** *Prānāyama,* Stress, Senior Citizens, PSS-14 questionnaire

**Introduction:**

Stress is a major factor in old age, which is the main contributor to late-life depression. It causes a number of psychosomatic illnesses, including hypertension, diabetes, dementia, etc. There is clearly a correlation between chronic stress and older persons' health, even though it is impossible to pinpoint how much. The constant production of the stress hormone causes a rise in blood pressure. Therefore, it causes hypertension and cardiovascular disorders. There is little evidence that stress on its own results in chronically elevated blood pressure. But having unhealthy reactions to stress can put you at higher risk for hypertension, heart attacks, and strokes. Although blood pressure increases may not be directly linked to stress-related disorders like anxiety, hypertension, and depression, stress hormones may be to blame for artery damage that results in heart attacks in old age. In the long run, lowering stress levels might not necessarily result in reduced blood pressure. However, utilising a variety of stress management techniques can help to enhance the health of elderly workers by lowering blood pressure. *Yoga* is one of the finest non-pharmacologic methods to lower stress among the many options for managing stress in old age.

These days, *yoga* is becoming more and more well-liked all around the world due to its calming effects. It is an emerging spiritual science that aims to balance the body, mind, and soul. The three most popular aspects of yoga are asana (physical posture), p*rānāyama* (breathing techniques), and *dhyāna* (meditation). As a result, yoga is a great approach for older adults to relax and stretch tight muscles, lower stress levels, and increase blood circulation. Additionally, it lowers blood pressure, preserves joints, eases worry, increases strength and balance, and lowers anxiety. Through frequent *āsana* practise, *yoga* takes care of the physical, mental, and spiritual aspects as well as the physical, mental, and vitality aspects through *prānāyama.* Older individuals are particularly susceptible to psychosomatic illnesses including stress, anxiety, and depression due to a combination of factors, including sedentary lifestyles, physical limitations, poor diets, and social isolation from children. But stress increases the likelihood for elders to develop conditions like diabetes, arthritis, or hypertension. Although *prānāyama* is sometimes described as a "practise of the breath," it is actually a highly scientific exercise technique that works many different parts of the body, including the lungs. *Prānāyama* has a positive influence on all bodily systems, including the respiratory, cardiovascular, and central neurological systems.

*Prānāyama* has been translated as the “extension of *prāna* (life force)” (Wikipedia 2017).In order to get steadiness in mind; an aspirant is advised to do practice of the breath control by doing *prānāyama*.[[1]](#footnote-2)“When the breath is unsteady, the mind is unsteady. But when the breath is calm, the mind too will be still.” (Muktibodhananda, ,Hatha Yoga pradipika,Chapter2,Verse2) *Prānāyama* has been reported to be beneficial in treating a range of depression and other related disorders, improving autonomic functions, relieving, and reducing signs of oxidative stress. Practitioners report that the practice of *prānāyama* develops a steady mind, strong will-power, and sound judgment and also claim that sustained *prānāyama* practice extends life and enhances perception.[[2]](#footnote-3)Though the popularity of *prānāyama* increased day by day, still there is less research in this field. But during the pandemic, most persons including medical personnel felt the importance of breath control through the regular practice of *prānāyama.* Maharshi Patanjali has given much more importance on *prānāyama* than *asana* to maintain sound health for *sadhanā*[[3]](#footnote-4). There are four types of *pranayama*, i.e., heating *pranayama*, tranquilizing *prānāyama,* balancing *prānāyama* and cooling *prānāyama*. The last three types of *prānāyama c*an be practised in slow pace. Specific *prānāyama* practices like *Nādishuddhi*, *Ujjāyi*, *Sitali* and *Sitkāri* *prānāyama* and *Omkār prānāyama* have been shown to decrease Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), and increase pulse pressure (PP).[[4]](#footnote-5)’[[5]](#footnote-6)

**Scientific Aspects of *Prānāyama:*** While doing *prānāyama* consciously, mind is attached to the breathing pattern unconsciously. Therefore, it automatically regulates the mind to become calm, quiet and tranquil. Conscious breathing stimulates the parasympathetic nervous system through the vagus nerve which runs from the base of the brain all the way to the abdomen. This nerve is responsible for managing the nervous system responses and reducing the heart rate. The neurotransmitter acetylcholine is released by the vagus nerve and plays a pivotal role in increasing calmness and focus. Therefore, the more one stimulate the vagus nerve through *prānāyama*, the more acetylcholine it releases, directly lowering anxiety and stress levels. Researchers found that, with slow *prānāyama* practice the breathing has been found to increase bar reflex sensitivity, reduce sympathetic activity and chemo reflex activation in healthy subjects as well as hypertensive.[[6]](#footnote-7)Practising *prānāyama* specially *nadisodhana* and *bhrāmari prānāyama* regularly has an positive impact on autonomic nervous system and improve the functionality of parasympathetic nerves,[[7]](#footnote-8)

**Need of the study:** The study aimed to determine the effect of *prānāyama* on hypertensive elders to manage their stress and anxiety level.

**Materials and methods:** The present study was done by using one sample group for pre and post-test assessment. The effects of *prānāyama* were studied in 45 cases of moderate hypertensive elderly with age group of 60 to75 years. The subject of study was selected from the nearby locality of Satyam Yoga Academy of Bhubaneswar, Odisha through a personal interview. They have given details of their medical history and consent letter to go for a practice session of 60 days in the Academy. The subjects who had poor control of B.P. even with hypertension, drugs were selected for the study. The subjects were selected through convenient sampling method.

**THE INCLUSION CRITERIA**

The following criteria were included in the study;

* Male and Female
* Age 60 to 75 years of old
* Moderate Hypertensive systolic blood pressure from 145 to 179mmHg and diastolic(90 to100 mmHg)(2017 AHA guideline)
* Having moderate stress and anxiety level.
* Using high blood pressure medicine
* Without any cardiac surgery or heart problem

**THE EXCLUSION CRITERIA:**

* Thyroid disorder
* Any type of Hernia or heart problem
* Alcoholic or any type of addiction
* Uncontrolled diabetes
* Severe high blood pressure
* Kidney or Liver problem abnormally
* Yoga Practitioner

There are 30 males and 15 female elderly were willingly participated in the program. Their mean age is 63.13.They all having mild blood pressures and all were under medication.

**Tools Used:**

To find out stress level Perceived Stress Scale-14 is used to assess the stress before practice of *prānāyama* and after practice of *prānāyama*. The PSS-14 is one of the more popular tools for measuring psychological stress. The reliability and validity of the questionnaire has already proved by many researchers and various researchers also using this questionnaire in their research. It is a self-reported questionnaire that was designed to measure “the degree to which individuals appraise situations in their lives as stressful.”

Blood pressure was measured and recorded by digital blood pressure machine.

The *Prānāyama* intervention was given to subjects for 60 days. A guided training session was conducted by the yoga instructor of the institute for 4 days, and then the subjects were practised themselves under the supervision.

**Statically techniques used:** To arrive at result of the study, the data was collected, tabulated and analysed by using excel sheet. Mean, Standard Deviation, paired t test for comparison of data and percentage calculation had been done.

***Prānāyama*****Practice given to subjects:** Slow pace *Ujjāyi Prānāyama* for 5 minutes, then *Nādisodhan Prānāyama*for 15 minutes and *Bhrāmari Prānāyama*for 5 minutes. Then Omkar *Pranayama* for 10 minutes with Meditation was given regularly to the subjects at 6.30A.M. Prior to starting of *Prānāyama* session, the participants had practised loosening exercise regularly for 10 minutes. They were also requested to practise the same *prānāyama963.*at their home in the evening.

**Results:** The data was collected before practice through personal query and by PSS-14 questionnaire**.** The collected data was organised, tabulated and analysed by descriptive and inferential analysis.

**Finding-1:**

The Table -I reveals that in the elderly people 66.6% were male and 33.4% were female. Among them 21.12% were widow/widowers.42% was directly or indirectly neglected and abuse by their children, though 84% were supported by their children. 58% were having their own income as pension.

**Table-1: Distribution of participants according to age and sex**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sex** | **Age** | **Number of subjects** | **%(percentage)** |
| **Male** | **55 to70** | **30** | **66.6%** |
| **Female** | **55 to70** | **15** | **33.4%** |
| **Total** |  | **45** | **100%** |

**Finding-2:**

The Perceived Stress Scale-14 was used in the study gave a score of the stress level of participants before joining the program and after joining the program. Here the statistical tools, descriptive analysis and inferential analysis method was used to determine pre and post score.

**Table2: The effectiveness of *prānāyama* to relieve stress among elderly people in terms of frequency and percentage (pre-test and post-test):**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Pre test** |  | **Post Test** |  |
| **Level of Stress** | **Scoring** | **frequency** | **%** | **Frequency** | **%** |
| **High level Stress** | **27-40** | **35** | **77.77** | **15** | **33.33** |
| **Moderate Stress** | **20-26** | **10** | **22.22** | **30** | **66.66** |
| **Total participate** | **45** |  |  |  |  |

**Pre-test:** The Table -2 shows that 77.77% of participants were under high stress and 22.22% were under moderate stress.

**Post-test**: But after regular practice of *pranayama* for 60 days the **TABLE- 2** reveals that majority of elderly people are under moderate stress (66.66%) and smaller part of population were suffering from high stress (33.32%)

**Finding -3:**

**Table-3: Mean, Median, Mean Difference, Standard Deviation, and t value of elderly people before and after study**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tests** | **Mean** | **Median** | **Mean difference** | **Standard**  **Deviation** | **Paired t’ test** |
| **Pre-test** | **30** | **29** | **5.111** | **±4.10** | **21.45** |
| **Post test** | **24.889** | **25** |  | **±3.13** |  |

The data represented in Table-3 indicates that the mean value of pre-test is 30 with standard deviation ±4.10 and the mean value of post study data is 24.889 with standard deviation ±3.13.The mean difference is 5.111. The value of tis 21.45.The value of p is <.00001.The result is significant at<0.05.So it was evident that p*rānāyama* is effective in reducing stress among elderly people, those who were participating in the study.

**Calculation and analysis chart:**

P value and statistical significance: The two-tailed P value is less than 0.0001  
by conventional criteria; this difference is considered to be extremely statistically significant.

**Confidence interval**:

The mean of Group One minus Group Two equals 5.11  
95% confidence interval of this difference: From 4.63 to 5.59

Intermediate values used in calculations:

**t = 21.4476**, df = 44

**Finding-4:**

**Table-4: Mean and Standard Deviation of Systolic and diastolic blood pressure of 45 elderly participants**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | | | **Standard Deviation** | | |
|  | **Pre test** | **Post test** | | **Pre test** | **Post test** | |
| **Systolic blood pressure** | **159.33** | | **154.82** | **±6.31** | | **±6.16** |
| **Diastolic Blood Pressure** | **93.4** | | **90.66** | **±2.84** | | **±2.59** |

The **TABLE-4** reveals that the mean systolic blood pressure of 45 elderly participants was 159.33 with standard deviation of ±6.31 before starting of *pranayama* and the post-test value was 154.82 with standard deviation± 6.16.So the changes in blood pressure is not significant, but the regular practice of *pranayama* may reduce the systolic blood pressure some extent. It may be due to significant level of reduction of stress and anxiety level of the participants. Similarly, the mean diastolic blood pressure of the 45 participants before practice was 93.4 mmHg with standard deviation 2.84 and after post the diastolic blood pressure mean is 90.66 mmHg with standard deviation 2.59.

Hence, the study reveals that there are mild changes in blood pressure after the practice of *prānāyama*.

**Discussion:** The present study indicates that 77.77% elderly people have high perceived stress and 22.22% elderly have moderate perceived stress before the study and after the practice respectively. Therefore, the practice of *prānāyama* plays a significant role to reduce stress level and it also has positive impact on the blood pressure of the elder persons. Various scientific studies also reveal the positive impact of *prānāyama* on senior citizens. The study conducted by Hema.T (2010) reveals that the effect of selected relaxation technique including *pranayama* had a positive impact on the stress level of elderly person. As per the study participants having 78% stress level was reduced to50% of stress level, when they were exposed to practice session of relaxation technique along with *prānāyama*. In order to enhance the psychological aspect of senior citizens, yogic techniques should be prescribed for the therapeutic purposes.

**Conclusion:** The present study showed the therapeutic aspects of *pranayama* with its positive effect to reduce stress. So, *prānāyama* can be used as stress reducer to improve the mental wellbeing of the elderly population.

**Future Scope:** Future research study can be done taking a large sample and practising *prānāyama* for more than 12 weeks to arrive at definite conclusion about the effectiveness of *prānāyama*. Moreover, a comparative study can be done to know the effect of *prānāyama* on elder persons residing with family support and without family support.

**References:**

1. Manjunath, N. K., & Telles, S. (1999). Factors influencing changes in tweezer dexterity scores following yoga training. *Indian journal of physiology and pharmacology*, *43*(2), 225–229.
2. Birks, Y., McKendree, J., & Watt, I. (2009). Emotional intelligence and perceived stress in healthcare students: a multi-institutional, multi-professional survey. *BMC medical education*, *9*, 61. https://doi.org/10.1186/1472-6920-9-61
3. Sharma, V. K., Trakroo, M., Subramaniam, V., Rajajeyakumar, M., Bhavanani, A. B., & Sahai, A. (2013). Effect of fast and slow pranayama on perceived stress and cardiovascular parameters in young health-care students. *International journal of yoga*, *6*(2), 104–110. https://doi.org/10.4103/0973-6131.113400
4. Pau, A., Rowland, M. L., Naidoo, S., AbdulKadir, R., Makrynika, E., Moraru, R., Huang, B., & Croucher, R. (2007). Emotional intelligence and perceived stress in dental undergraduates: a multinational survey. *Journal of dental education*, *71*(2), 197–204.
5. Klainin-Yobas, P., Oo, W. N., Suzanne Yew, P. Y., & Lau, Y. (2015). Effects of relaxation interventions on depression and anxiety among older adults: a systematic review. *Aging & mental health*, *19*(12), 1043–1055. https://doi.org/10.1080/13607863.2014.997191
6. Gopal, A., Mondal, S., Gandhi, A., Arora, S., & Bhattacharjee, J. (2011). Effect of integrated yoga practices on immune responses in examination stress - A preliminary study. *International journal of yoga*, *4*(1), 26–32. https://doi.org/10.4103/0973-6131.78178
7. Veerabhadrappa, S. G., Baljoshi, V. S., Khanapure, S., Herur, A., Patil, S., Ankad, R. B., & Chinagudi, S. (2011)." Effect of yogic bellows on cardiovascular autonomic reactivity". *Journal of cardiovascular disease research*, *2*(4), 223–227. https://doi.org/10.4103/0975-3583.89806
8. Bhavanani, A. B., Madanmohan, & Udupa, K. (2003). Acute effect of Mukh bhastrika (a yogic bellows type breathing) on reaction time. *Indian journal of physiology and pharmacology*, *47*(3), 297–300.
9. Sharma, V. K., Trakroo, M., Subramaniam, V., Rajajeyakumar, M., Bhavanani, A. B., & Sahai, A. (2013). Effect of fast and slow pranayama on perceived stress and cardiovascular parameters in young health-care students. *International journal of yoga*, *6*(2), 104–110. https://doi.org/10.4103/0973-6131.113400
10. Raghuraj, P., Ramakrishnan, A. G., Nagendra, H. R., & Telles, S. (1998). Effect of two selected yogic breathing techniques of heart rate variability. *Indian journal of physiology and pharmacology*, *42*(4), 467–472.
11. Pal, G. K., Velkumary, S., & Madanmohan (2004). Effect of short-term practice of breathing exercises on autonomic functions in normal human volunteers. *The Indian journal of medical research*, *120*(2), 115–121.
12. Pal, G. K., Velkumary, S., & Madanmohan (2004). Effect of short-term practice of breathing exercises on autonomic functions in normal human volunteers. *The Indian journal of medical research*, *120*(2), 115–121.
13. Suter, P. M., Maire, R., Holtz, D., & Vetter, W. (1997). Relationship between self-perceived stress and blood pressure. *Journal of human hypertension*, *11*(3), 171–176. https://doi.org/10.1038/sj.jhh.1000409
14. Cohen, S. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), T*he Claremont Symposium on Applied Social Psychology*. The social psychology of health (p. 31-67). Sage Publications, Inc.
15. Sharma, V., Trakroo, M., Subramaniam, V., Rajajeyakumar, M., Bhavanani, A., & Sahai, A. (2013). Effect of fast and slow pranayama on perceived stress and cardiovascular parameters in young health-care students. *International Journal of Yoga*, *6*(2), 104.
16. Jerath, R., Edry, J. W., Barnes, V. A., & Jerath, V. (2006). Physiology of long pranayamic breathing: neural respiratory elements may provide a mechanism that explains how slow deep breathing shifts the autonomic nervous system. *Medical hypotheses*, *67*(3), 566–571. https://doi.org/10.1016/j.mehy.2006.02.042
17. Joseph, C. N., Porta, C., Casucci, G., Casiraghi, N., Maffeis, M., Rossi, M., & Bernardi, L. (2005). Slow breathing improves arterial baroreflex sensitivity and decreases blood pressure in essential hypertension. *Hypertension (Dallas, Tex. : 1979)*, *46*(4), 714–718. https://doi.org/10.1161/01.HYP.0000179581.68566.7d

1. Swami Swatmarama,Hatha Yoga pradipika. [↑](#footnote-ref-2)
2. Pranay Kumar Gupta, Manoj Kumar, Riti Kumari, Deo JM. Anuloma-Viloma Pranayama and Anxiety and Depression among the Aged. Journal of the Indian Academy of Applied Psychology 2010; 36(1):159-164. [↑](#footnote-ref-3)
3. Effect of yogic bellows on cardiovascular autonomic reactivity.*Veerabhadrappa SG, Baljoshi VS, Khanapure S, Herur A, Patil S, Ankad RB, Chinagudi S*, *J Cardiovasc Dis Res. 2011 Oct; 2(4):223-7.*, [↑](#footnote-ref-4)
4. Singh S, Gaurav V, Parkash V. Effects of a 6-week nadi-shodhana pranayama training on cardio-pulmonary parameters. *Journal of Physical Education and Sports Management.*2011; 2:44–7. [[Google Scholar](https://scholar.google.com/scholar_lookup?journal=Journal+of+Physical+Education+and+Sports+Management&title=Effects+of+a+6-week+nadi-shodhana+pranayama+training+on+cardio-pulmonary+parameters&author=S+Singh&author=V+Gaurav&author=V+Parkash&volume=2&publication_year=2011&pages=44-7&)] [[Ref list](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3734635/#ref13)] [↑](#footnote-ref-5)
5. Subbalakshmi NK, Saxena SK, Urmimala, D’Souza UJ. Immediate effect of “Nadi-shodhana Pranayama” on some selected parameters of cardiovascular, pulmonary, and higher functions of brain. *Thai J Physiological Sci.*2005; 18:10–6.  [↑](#footnote-ref-6)
6. Joseph CN, Porta C, Casucci G, Casiraghi N, Maffeis M, Rossi M, et al. Slow breathing improves arterial baroreflex sensitivity and decreases blood pressure in essential hypertension. *Hypertension.*2005; 46:714–8. [ [↑](#footnote-ref-7)
7. H. Shashikiran, S. Shetty, P. Shetty, C. Kumar, **A study on influence of yoga on autonomic variables on young adults**, Int J Innov Res Dev, 4 (2) (2015) [↑](#footnote-ref-8)