



A COMPARISON OF YOGIC EXERCISE FOR ANALYSIS OF POST TESTING BREATH HOLDING TIME

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ABSTRACT

Around the world, people are starting to understand that yoga is not just a form of rehabilitation but also a means of improving mental and social control (moral or spiritual). Since yoga is the science of moral living, it is meant to be a part of everyday existence. It affects every facet of the individual, including the vital, mental, emotional, psychic, and spiritual. Yoga strives to achieve perfect synchronisation between the many body processes so that the body as a whole benefit from them. The equilibrium of mind and body is the main focus of yoga. The philosophy of yoga is derived from Indian metaphysical concepts. The Sanskrit term for yoga signifies unification or merging. Achieving self-enlightenment and striking a balance between the body and mind are the ultimate goals of this philosophy. Yoga employs posture, movement, breathing, relaxation, and meditation to accomplish this goal and cultivate a vibrant, healthy, and well-rounded way of living. Pranayama practice on a regular basis can help to calm down mental disturbances such as excitement, worry, fear, rage, disappointment, lust for sex (lasciviousness), and other mental perversions. Additionally, practicing Pranayama enhances brain cell functioning, which leads to improvements in memory, discriminating, and observational skills. As a result, Sadhakas find it easier to focus and meditate. Another advantage of pranayama is that it fosters the habit of deep breathing, which has numerous health benefits when done regularly. It is thought that the quantity of breaths we take each day affects how long we live in nature. Man is reborn based on the karmas (deeds) he committed during his previous existence. Our next birth, whether as humans or as different kinds of animals, is determined by the tendencies that our karmas (deeds) have formed. Regular practitioners of Pranayama require fewer breaths, which translates into longer life spans for men.

KEY WORDS: *Yogic Exercise, Pranayam, Kapalbhathi, Post Testing, Breath Holding Time*

INTRODUCTION

Yoga begins with the body-system, where the cells, tissues, organs, and systems of the body work together. From there, it progressively moves to the body and the mind working together, as well as the people in the family,

neighbourhood, village, country, human society, animal and plant kingdom, objects and beings of the universe, and, finally, the unification of the individual soul with the universal consciousness.

It is best to prevent other pieces from moving. Maintaining a gay and relaxed face can help you practise breathing more efficiently. Additionally, six additional varieties are provided so that the cycle of breathing and exhaling can be practiced. The breathing rate is higher in each of these categories. These are the precise kinds of rapid breathing. Prior to engaging in these kinds of exercises, one should first sit in Padmasana, Vajrasana, or Swastikasana. Next, maintain the Dhyana Mudra with the left hand and the Pranava Mudra with the right hand. The eyes ought to be closed, and Breathing is the only thing that has to be focused on in order to be learned.

- **Type - 1**

Breathe in and out via both nasal passageways while keeping both nostrils open. All that this type does is breathe rapidly via both nasal passages. It is recommended to breathe in as quickly as possible and as long as it is possible.

- **Type - 2**

Inhale through your left nostril and exhale through the same nasal route while making the Pranava Mudra. You can seal your right nostril with the thumb of your right hand. This type is essentially characterised by rapid left nostril breathing.

- **Type - 3**

With this type, the left nostril should be closed, and the right nostril should be used for rapid breathing.

- **Type - 4**

This style involves closing the right nostril while inhaling via the left, closing the left nostril instantly after, and exhaling through the right nostril. Try breathing quickly in this manner by opening and closing your nose.

- **Type - 5**

Similar to the last breathing technique, this one involves closing the left nostril while inhaling through the right, then quickly closing the right nostril while exhaling through the left.

- **Type - 6**

The two breathing patterns that came before it, type 4 and type 5, were combined to create this type. Breathe in via your left nostril first, then out through your right, and finally out through your left. Later, keep doing the same thing, that is, breathe in and out from your left and right nostrils in turn. Increase the rate at which you breathe to further transition to fast breathing. Breathing rate can be greatly increased with enough practice. Breathing should begin with eleven cycles at first, and then be extended to twenty-one cycles without fear. Later on, though, the breathing should be done for two to three minutes every day together with other asanas. You can also practise all of these sorts with gradual inhalations and exhalations. It is vital to understand that practicing these breathing techniques does not equate to performing Pranayama. This is just a warm-up for practicing Pranayama in real life.

EFFECT OF ANULOM-VILOM PRANAYAMA'S

In this way, pranayama is similar to other methods of self-soothing like exercise, relaxation, and meditation. Pranayama seems to modify stress response systems by lowering felt stress and anxiety. Consequently, this lowers physiological arousal, which includes heart rate, blood pressure, and breathing ease. Additionally, there is proof that practicing pranayama increases heart rate variability, a sign of the body's increased adaptability to stress. A brief yet fascinating study describes Pranayama's impact on the stress response in more detail. By using functional MRIs, University of Utah researchers demonstrated in 2008 that Pranayama practitioners had the lowest pain-related brain activity and the highest pain tolerance among control individuals and practitioners. The study emphasises the benefits of methods like yoga that can help someone control their stress levels and, consequently, their reactions to pain. It is well recognised that pranayama methods enhance one's ability for work and general performance. In addition to muscular strength, cardiopulmonary fitness, and coordination, physical fitness encompasses the entire spectrum of physical attributes that can be interpreted as a comprehensive assessment of all the systems and parts of the body that are involved in the activity. Compared to other established risk variables, low physical fitness (primarily cardio respiratory fitness) appears to be a more powerful predictor of cardiovascular and all-cause death in adults.

Stress in the workplace, in society, and in the environment is something that everyone encounters. It is well recognised that stress raises the chance of cardiac events. Through the modulation and optimisation of sympathetic processes, pranayama and meditation are frequently suggested as ways to reduce stress and enhance cardiovascular and mental health in individuals.

EFFECTS OF ALTERNATE NOSTRIL BREATHING-

- An adequate supply of oxygen is guaranteed, and carbon dioxide is efficiently eliminated.
- Breathing becomes more efficient because more oxygen is made available with each breath.
- Toxins are removed from the blood.
- Extremely useful for reducing stress.
- Aids in the reduction of mental diseases such as depression and anxiety. Moreover, it lessens mental hyperactivity problems
- Balancing Ida and Pingla provides all the advantages of deep breathing while also clearing all obstructions in the pranic energy lines, which may result in spiritual awakenings.

EFFECT OF RIGHT NOSTRIL BREATHING -

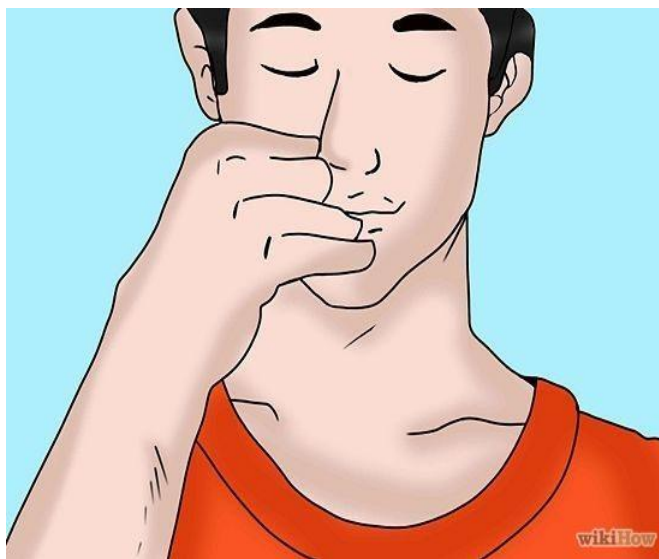


Figure 1- Right nostril Breath

By raising body temperature, it eliminates the imbalance of Kafa (mucus). This works wonders for obesity. Weight loss can be achieved with regular practice of the right nostril breath.

- Increasing prana in the body boosts vitality;
- Works wonders for low energy and depression.
- Extremely useful for reducing stress.
- Aids in the reduction of mental diseases such as depression and anxiety.

- Provides all the advantages of deep breathing in addition to balancing Ida and Pingala, which clears any obstructions in the pranic energy channels and may result in spiritual awakenings.

EFFECT OF LEFT NOSTRIL BREATHING-

- i. Since it has been previously noted that sympathetic activity is reduced during left nostril breathing, changes in the autonomic balance may account for the instantaneous decrease in all cardiovascular parameters in our patients.
- ii. It has also been noted that four daily repetitions of exclusive left nostril breathing, for a month, decreased sympathetic activity.



Figure 2- Left Nostril Breath

- You can lower the breathing ratio if you experience any minor pain.
- Never push the breathing to be in a particular proportion.
- Individuals who have had heart, brain, or abdomen procedures ought to speak with a medical professional or consultant.
- Please take your time increasing the proportions; it won't help. However, you might try practicing the simple ratio (4:6 seconds) for a little while longer.
- In the beginning, one should breathe in for three seconds and out for three seconds. You can increase it gradually to 4:4 seconds, 3:6 seconds, and finally 4:8 seconds. At first, the practice can go up to five minutes, but it can be gradually extended to fifteen minutes in a safe manner.

RESEARCH METHODOLOGY

SELECTION OF SUBJECTS

This Non-equivalent pre-test post-test control group design included 120 adolescent students in the age group 13 to 18 years (studying in grades VIII- XII) through Stratified random sampling technique. 60 students from each stratum will be selected by systematic random sampling technique for both pranayama and non-pranayama group. A written informed consent will obtain from all participants prior to their inclusion in the study. With the help of a questionnaire, participation eligibility will ascertain where all subjects are non-yoga practitioners and did not have formal training in yoga and pranayama. After providing them with a thorough explanation of the study's objectives, training schedule, and testing conditions, as well as an assurance that their data would only be utilised for this particular study, they voluntarily provided their written agreement. Additionally, students were told that if they felt uncomfortable or found it difficult to continue with the training plan, they could drop out of the study at any moment.

SELECTION OF VARIABLES

Before drawing a conclusion, the researcher read through the literature that was accessible and spoke with his guide and a number of experts. Availability of methodologies, procedure's viability and dependability, and result were all thoroughly examined; the problem was chosen based on the conclusions. A few variables were chosen to be tested during the study after the many aspects connected to the issue were examined.

METHOD

In this study, the experimental research approach was used by the researcher.

Three groups were involved; group A served as the control group, and groups B and A as the experimental groups.

- I. Pallabhati, Group "A";
- II. Pranayama, Group "B";
- III. The control group (no practice) made up the third group. The testing period lasted for twelve weeks. Prior to the practice, the pre-test is conducted.

RESULTS AND DISCUSSION

Over time, yoga will prove to be advantageous for those who consistently practise it. The reason for this is that yoga enhances mental and physical well-being and gives the mind power over the body. A student's ability to concentrate is enhanced by yoga. You can see now that increasing your degree of attention is the only method to improve your exam scores. Furthermore, yoga promotes physical well-being by lowering blood pressure, decreasing tardiness, increasing confidence, improving sleep quality, relieving headaches, and—most importantly—improving mental clarity.

Regular practice of yoga and meditation can have a positive impact on the student body, helping to combat issues like anxiety and despair. Long-term, this would prove advantageous for the students. While meditation offers mental clarity and physical control, yoga enhances one's physical and mental well-being.

DESCRIPTIVE STATISTICS OF BREATH HOLDING TIME

Table-1: Descriptive statistics of the data measured in the post testing breath holding time

Different Groups	Mean	Std. Deviation	N
Pranayama	41.700	12.567	40
Kapalbhati	48.230	8.854	40
Control	35.500	10.035	40
Total	41.825	11.752	120

The descriptive statistics values for the physiological variable of breath holding time for the experimental groups (Pranayama, Kapalbhati, and Control) are displayed in Table No. 1. The mean and standard deviation values for the Pranayama, Kapalbhati, and Control groups are 41.700 ± 12.567 , 48.230 ± 8.854 , and 35.500 ± 10.035 , respectively. In total, 41.825 ± 11.752 is the same.

Table-2: Descriptive statistics of the data measured in the post-testing after adjustment with the initial difference breath holding time

Different Groups	Mean	Std. Error	95% Confidence Interval

			Lower Bound	Upper Bound
Pranayama	39.855 ^a	.584	38.705	41.004
Kapalbhati	46.332 ^a	.584	45.185	47.482
Control	39.287 ^a	.595	38.115	40.463

(a) The following values have been assessed for covariates that are included in the model: 39.0067 is the pre-breath holding time.

Table-2, displays the mean and standard error for each post-testing group following correction. This pertains to the following groups: Control Group 39.287 & 0.595, Kapalbhati Group 46.332 & 0.584, and Pranayama Group 39.855 & 0.584

Table-3: Ancova table for the post-test data of breath holding time

Source	Sum of Squares	Df	Mean Square	F	Sig.(p-value)
Pre-Breath Holding Time	14069.493	1	14069.493	840.933	.000
TreatmentGroup	1496.183	2	748.091	44.715	.000
Error	2442.702	143	16.733		
CorrectedTotal	20583.495	147			

Table-3, presents the results of the test of the difference between the subject effects. It demonstrates that the three groups that were chosen had significantly different pre-test values for the physiological variable of breath holding time, with a value of 840.933 serving as the foundation for the Analysis of Co-Variance. Additionally, a significant difference (significant at the 0.05 level) is identified between the experimental and control group post test scores, with the value discovered.

Table-4 : Post hoc comparison for the group means in post-measurement adjusted with the initial differences breath holding time

(I) Different Groups	(J) Different Groups	MEAN DIFFERENCE (I-J)	SIG.a (p-value)
Pranayama	Kapalbhati	-6.475*	.000
	Control	.565	.500
Kapalbhati	Pranayama	6.475*	.000
	Control	7.047*	.000
Control	Pranayama	-.565	.500
	Kapalbhati	-7.047*	.000

Using projected marginal means as a basis

a. Least Significant Difference adjustment for multiple comparisons (equal to no modifications). At the 0.05 level, the mean difference is significant.

The values of the post hoc test for the physiological variable of breath holding time for the selected groups are shown in Table 4.24. This indicates that there is a significant difference between the post test values for the

Pranayama Group and the Kapalbhathi Group (6.475*, significant at 0.05 level), the Pranayama Group and the Control Group (.565, significant at 0.05 level), and the Kapalbhathi Group and the Control Group (7.047*, significant at 0.05 level).

Regarding the breath holding time variable, the experimental group, the Pranayama group, showed increased mean values from the pre test to the post test, while the control groups and the Pranayama group showed similar mean values. This is shown in table, where the post testing breath holding time mean and S.D. values of the Pranayama group, the Kapalbhathi group, and the Control group were found to be 41.720 ± 12.565 , 48.260 ± 8.852 , and 35.500 ± 10.037 , respectively. Table -4 displays the results of the post hoc comparison of the means. The differences between the groups that underwent pranayama and kapalbhathi were -6.476^* ($p < .05$), $.569$ ($p > .05$), and 7.045^* ($p < .05$) for the pranayama group and the control group, respectively. Therefore, the breath holding time variable considerably affected the Kapalbhathi group, indicating a favourable feature of health.

CONCLUSION

The yoga breathing technique known as pranayama is derived from the phrases prana and ayama. Pranayama is the discipline of expanding our own Prana so that it harmonises with the universal Prana. Prana means "life force," while ayama means "expansion, manifestation, or prolongation." As a result, an individual's consciousness becomes one with universal awareness, or merges into it. We come to understand in this union that we are an immortal spirit rather than just a finite physical body. Pranayama is controlling life force, or prana, on a subtle level and breathing on a physical one. This is accomplished by focusing attention on a specific region of the physical or subtle body, such as the heart or the sixth chakra, sometimes known as the "third eye," located in the middle of the forehead, as well as by deliberately inhaling (Purak), exhaling (Rechaka), and holding your breath (Kumbhaka).

QUIET BREATHING

The body's continuous process of oxidation or combustion is the cause of all internal functions. Additionally, blood circulation and respiration also aid in the combustion process. Consequently, breathing and blood circulation are impacted by any movement of the body, whether internal or external. Because of this, breathing more quickly supplies the necessary oxygen for the affected movements. In sync with the body's increased movement, the breathing rate also increases. When there is no physical movement or when the body is in a calm or normal state, it is evident that the breathing is quiet or smooth. Called Quiet Breathing, this type of breathing

is. There is no kind of control maintained over this breathing. The silent breathing of this kind usually becomes natural after assuming the ultimate posture of any asana and stabilising this pose for a while. Additionally, during the time spent in the stabilised Asana position, one should try to relax their body as much as possible in order to engage in this kind of breathing.

DEEP BREATHING

It is preferable to try deep breathing as the initial step in that direction since we wish to manage the breathing after learning about the respiration system or process. The peaceful breathing process is not within our control. However, control must be used in conjunction with deep breathing exercises. There are two main factors to take into account for this: The first step in further slowing down breathing is to manage the movements involved in inhaling and exhaling. This will also lower the body's requirement for oxygen, which will further slow down breathing. Because of the way the body is designed, controlling breathing becomes difficult or even impossible if the body's requirement for or consumption of oxygen is not decreased. The simplest method to lower oxygen use is to cease all bodily motion and make an effort to relax every muscle. Of course, maintaining a solid, relaxed posture is essential when engaging in deep breathing exercises. And you can achieve this in any sitting meditation position. The ideal Asana position is Padmasana, though. Vajrasana and Swastikasana are the other poses that are better for sitting. However, once the Asana is done, it should be happily maintained until the breathing research is over. Breathing will become distracted by any strain anywhere. For this reason, when meditating, the asana position should be comfortable and solid. The Dhyana Mudra hand position is required. Without moving, one can achieve focus by keeping their neck and spine in an upright position and closing their eyes. Let your muscles relax and focus entirely on your breathing. This will reduce the breathing rate down to a certain point, when it will stabilise and reach the optimal state of even breathing. There is no control over this. There isn't any movement on the chest. It is limited to the movement of the lungs and abdominal muscles. Once the breathing has been this effortless for a while, the movements of the lungs and abdomen should be brought under mental control and slowed down even more.

FAST BREATHING

Deep breathing occurs when the pace of silent breathing is purposefully slowed down; rapid breathing occurs when the pace of quiet breathing is purposefully raised. Here, however, there is no indication of a brief inhale-exhale cycle. It is anticipated that thorough inhalation and exhalation may accelerate breathing. To maintain the

pattern of rapid breathing, one must consistently practise. This type of breathing is simple to comprehend and practise. Of course, its advantages are likewise circumscribed. Breathing quickly helps to cleanse the nasal channel and strengthens the breathing system's supporting muscles. One occasionally experiences a spinning sensation in the head when practicing rapid breathing. However, one shouldn't give it any thought. During these times, start peaceful breathing instead of rapid breathing. Once this kind of breathing has been practiced and ingrained enough, there are no issues. It is also possible to do this breathing in Padmasana or Vajrasana. In order to cleanse the nasal passages, practise rapid breathing for two to three minutes before starting to study deep breathing; rapid breathing need not be done for an extended amount of time.

REFERENCES

1. Ansgar, C. (2007) 'Psychophysiological effects of breathing instructions for stress management' *Applied psychophysiology and biofeedback*, 32(2), pp. 89-98.
2. Bal, B. S., and Kaur, P.J. (2009) 'Effects of selected asanas in hatha yoga on agility and flexibility level', *Journal of Sport and Health Research*, 1(2), pp. 75-87.
3. Balayogi, B.A. and Sanjay, Z. (2012) 'Immediate effect of chandra nadi *Pranayama* (left unilateral forced nostril breathing) on cardiovascular parameters in hypertensive patients' *International journal of yoga*, 5(2), pp. 108-111.
4. Gupta S., Kumari, R. Kumar, M. and Deo, J.M. (2010) 'Anuloma-Viloma *Pranayama* and anxiety and depression among the aged', *Journal of the Indian Academy of Applied Psychology*, 8(3), pp. 159-164.
5. Hadi, N. and Hadi, N. (2007) 'Effects of hatha yoga on well-being in healthy adults in Shiraz, Islamic Republic of Iran.' *Eastern Mediterranean Health Journal* 13(4), pp. 829-837.
6. Harinath, K. (2004) 'Effects of Hatha yoga and Omkar meditation on cardiorespiratory performance, psychologic profile, and melatonin secretion', *The Journal of Alternative & Complementary Medicine*, 10(2), pp. 261-268.
7. Hartranft, C., (2003) *The Yoga-Sutra of Patanjali: a new translation with commentary*, Shambhala Publications.
8. Hejazi, R. and Ghasemi, M. (2010) *Effect of yoga on depression of men*; Psychiatry Department of Islamic Azad University, Iran.
9. Sengupta, P. (2012) 'Health impacts of yoga and *Pranayama*: A state-of-the-art review', *International journal of preventive medicine*, 3(7).
10. Sharma, V. K. (2014) 'Effect of fast and slow *Pranayama* practice on cognitive functions in healthy

volunteers', *J Clin Diagn Res*, 8(1), pp. 10-13.

11. Singh, S. Vishaw, G. and Parkash, V. (2011) 'Effects of a 6-week nadi-shodhana *Pranayama* training on cardio-pulmonary parameters', *Journal of Physical Education and Sport Management*, 2(4), pp. 44-47.
12. Sivasankaran, S. (2004) '*Effect of a six-week yoga training and meditation program on endothelial function*', American Heart Association Scientific Sessions, New Orleans.
13. Sodhi, C., Singh, S. and Dandona, P.K. (2009) 'A study of the effect of yoga training on pulmonary functions in patients with bronchial asthma', *Indian J Physiol Pharmacol*, 53(2), pp. 169–174.