



Pranayama Practioners and Brisk Walking Group on Breath Holding Time and Concentration Among Sedantary Woman

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Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 14 Oct 2023	The purpose of the study was to find out the impact of pranayama and brisk walking practices on Breath holding time and concentration among sedentary Women. To achieve the purpose of the study, 45 middle aged sedentary women with age ranged from 30 to 40 years. Were randomly selected as subjects from the administrative work of various departments in trichy, Tamilnadu. The selected subjects were divided into three experimental groups and were subjected to a training program for 12 weeks. Pranayama Prctioners was administered to group I (n =15) and Brisk Walking was administered to group II (n = 15) and group III (n = 15) as a Control group group. Test was conducted for Pranayama Prctioners, Brisk Walking and Control groups before and after 12 weeks training program. The tachistoscope was used to measure the concentration. The data was collected and analyzed statistically by Analysis of covariance (ANCOVA) to find out the significant differences. The level of confidence was fixed at 0.05 levels. Result: the experimental group had achieved significant improvement on Pranayama Prctioners and Brisk Walking when compared to Control group. It was also observed that the 12 weeks of Pranayama Prctioners, Brisk Walking and Control Group program have significantly improved the Breath holding time, focusing ability in concentration on particular object and administrative work performance of middle aged sedentary Woman.
CC License CC-BY-NC-SA 4.0	Keywords: Concentration, Breath holding time, Pranayama , Brisk Walking.

1. Introduction

According to the World Health Organization, only one in ten people exercise regularly and a majority does not follow a healthy diet. The main culprit is our penchant for junk food as can be seen from the popularity of fast food chains and other western eateries. Even local foods such as fried noodles, friend rice and snacks and savories are laden with fat and calories. Thus, consuming this type of food on a daily basis can contribute to weight gain. Leading a Healthy Life style A healthy lifestyle means maintaining a balanced and nutritious diet as well as engaging in sports or other fitness related activities. A healthy diet alone however is inadequate to ensure a healthy body as physical activity helps to keep one in shape and free of sickness and disease. They do not realize however that sets the stage for an unhealthy lifestyle for their children who quickly become addicted to such foods. Thus, parents can counter this problem by cooking or preparing meals that do not take up time such as cheese sandwiches, soup, stir friend vegetables. School canteens must be urged to sell only highly nutritious food and drinks. Vending machines that sell soft drinks and drinks that are spiked with sugar should be banned. Hence, school going children would be exposed to healthy eating form young

Three phases. A pranayama cycle has three phases:

- Puraka, or inhalation
- Kumbhaka, or retention
- Rechaka, or exhalation

Types of Pranayama

Practices Pranayama have both the slow and fast variations. While there are many different types of pranayama practices, such famous are

- Bhramari, or bee breath, is used to help calm the mind and racing thoughts.
- Nadi Shodhan, or alternate nostril technique, is believed to centre your mind by joining the right and left sides of your brain.
- Kapal Bhati, or skull shining technique, is practiced for energy clearing and its detoxifying effects on the body.
- Bhastrika, or bellow breath, is used to boost energy levels.

Psychosomatic disorders. As a yogic practice that can potentially harmonize your mind and body, pranayama may offer many benefits to your overall well-being. it helps improve mental issues such as anxiety and stress, or that it alleviates the symptoms of certain physical conditions. Psychosomatic disorders are diseases involving both the body and mind. Some psychosomatic diseases include migraine headaches, [ulcers](#), and [psoriasis](#). By joining the body and mind through the breath, pranayama may help and manage.

Perform physical and mental work to get leisure peaceful sleep, exercise regularly, need to drink warm luke water often and avoid spice food before going to bed. The quality and not the quantity of sleep are important, although 6- 8 hours' sleep is necessity for sound health. Thus, balanced diet, regular exercise and sound sleep are the prerequisites for sound physical fitness and physical fitness is the key to a productive and successful life. Being a nibbler not a gourmet, need to have salads before eating the meal, avoid starve and overeat subsequently, Fast food and canned food are costly both for pocket and heart, Yellow orange and green vegetables and fruits add life to heart and as age advances eat less and exercise more. Physical well-being wholly depends upon a sound brain as all activities of our body are controlled by the mind. Any disturbance in the mind will disturb the body giving rise to various abnormalities. So a sound sleep is must for a healthy person. Avoid sleep during the day, by walking in evening at least 30 minutes is good Before going to bed get rid of stress.

Odd number breathing pattern while walking

I use an odd number pattern to my breathing routine while I'm out walking. The pattern is based on the number of steps you choose to count. The idea is that by using an odd number, the cycle will repeat itself on the opposite foot each time the cycle begins.

- Begin by inhaling through your nose thereby expanding the belly for 4 steps.
- Then, exhale through your mouth, for 3 steps (pulling your abs in).
- Repeat this cycle: 4 in, 3 out.
- The cycle is 7 steps (an odd number).
- Adjust the pattern as you see fit but always use an odd number with the inhale 1 step more than the exhale to begin the next cycle on the opposite foot.

Going forward, if you need to shorten the count - especially if breathing gets heavier with more exertion - just change to 5 steps; 3 steps inhale, 2 steps exhale.

Example of the odd number breathing pattern for waking

1. First step (left foot) breathes in
2. Second step (right foot) breathe in

3. Third step (left foot) breathe in
4. Fourth step (right foot) breathe in
5. Fifth step (left foot) breathe OUT
6. Sixth step (right foot) breathe OUT
7. Seventh step (left foot) breathe OUT

Need to repeat the cycle. Observe that the 1st step changes to start on right foot!

1. First step (Right foot) breathes in
2. Second step (left foot) breathe in
3. Third step (right foot) breathe in
4. And so on, and so on....

2. Materials And Methods

The present study consists of 45 middle aged sedentary men from the administrative work of various departments in Tiruchy, Tamilnadu. The subjects were randomly selected and their age ranged from 30 to 40 years. They were divided into three groups namely Pranayama Practioners group (PP) (n =15), Brisk Walking group (BWG) (n = 15), and Control Group (CG) (n =15). Concentration and Breath Holding Time was selected as dependent variables for this study. Concentration was measured using tachistoscope. Breath Holding Time was measured by nose clip method, pranayama Practioners and Brisk walking group were given training for a period of 12 weeks for 5 days per week in the morning session. Control group did not go for any training. The training program was administered for 45 minutes per session. The pre and post- test were taken before and after training program and were statistically analysed with Analysis of covariance (ANCOVA). The level of confidence which was fixed 0.05 level of significance.

Selection of subjects the purpose of the study was to find out the effect of Pranayama practioners and Brisk walking group on Breath holding time, Concentration. To achieve this purpose, forty-five sedentary women were randomly selected and were divided into three groups of fifteen subjects each

Selection of variables for this study the physiological variable -breathing holding, psychological variable -Concentration were chosen as variables. The experimental group underwent training for 5 days per week for twelve weeks. The data collected before and after the training period for analysis.

Selection of tests

Breath holding time was measured in group by nose clip method, concentration was measured by tachistoscope.

3. Results and Discussion

TABLE 1. Analysis Of Covariance for The Pre-Test, Post Test And Adjusted Post Test Data On Breath Holding Time Of PP, BWG And Control Group

Mean	PPG	BWG	CG	SOV	Ss	df	Mean square	'F'Ratio
Pre test mean	70.86	68.29	67.26	B	84.31	2	42.16	2.65
				W	669.60	42	15.94	
Post test mean	73.65	70.24	68.25	B	158.04	2	79.02	5.89
				W	563.87	42	13.43	
Adjusted post test mean	71.88	71.23	68.33	B	37.28	2	18.64	

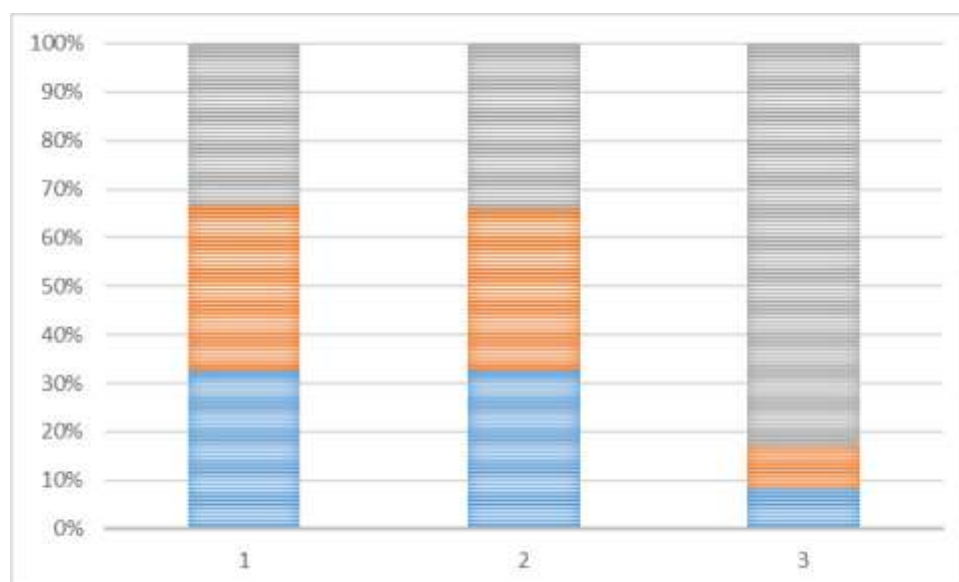
									7.65
				W	99.98	41	2.44		

*The required value for df (2, 42) at 0.05 level = 3.21 *The required value for df (2, 42) at 0.01 level = 5.14

Scheffe post-test of mean difference between groups on concentration

MEAN VALUE		MEAN DIFFERENCE	CLASS INTERVAL
71.88	69.93	0.72	1.83
	69.93	71.23	1.52
			1.83
		2.24	1.83
71.88	71.23		

Graphically present adjusted mean values of concentration among groups



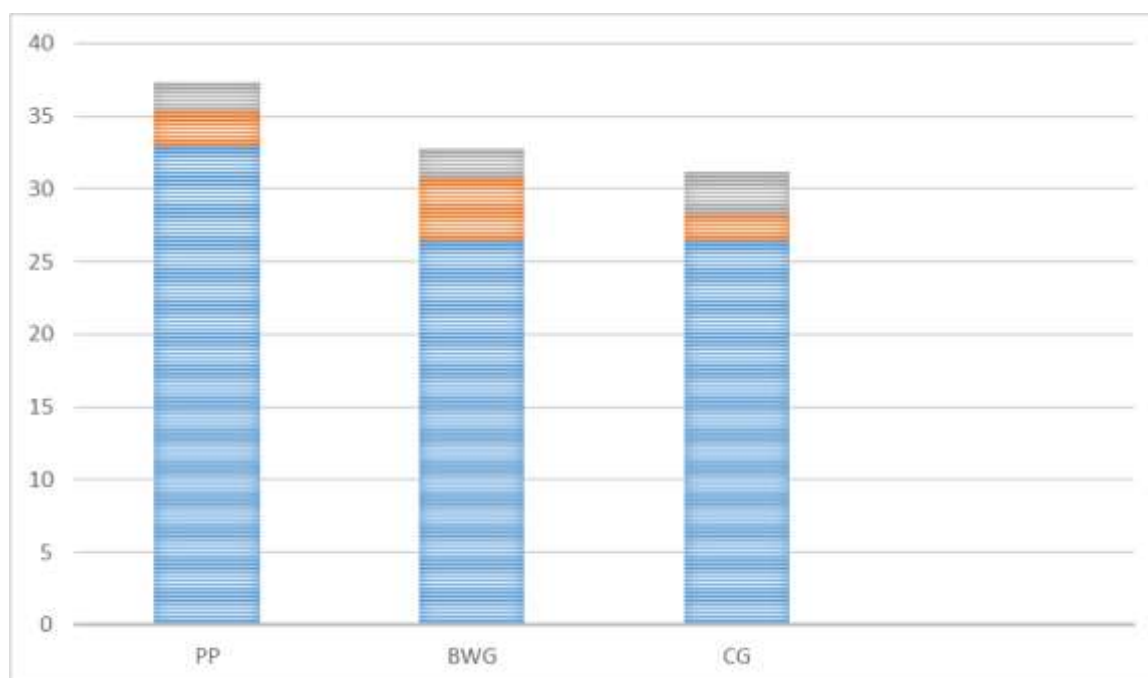
Analysis Of Covariance For The Pre Test, Post Test And Adjusted Post Test Data On Breath Holding Time of PP, BWG AND CG Among Sedatary woman.

Mean	PPG	BWG	CG	SOV	Ss	df	Mean square	'F'Ratio
Pre test mean	24.63	25.28	24.52	B	26.84	2	13.42	0.25
				W	2285.47	42	54.42	
Post test mean	31.06	31.89	25.86	B	694.58	2	347.29	9.86*
				W	1479.33	42	35.22	
Adjusted post test mean	32.93	32.99	26.38	B	538.15	2	269.07	20.06*
				W	549.81	41	13.41	

Scheffe post-test of mean difference between groups on Breath Holding Time of PP,BWG AND CG Among Sedatary woman.

	MEAN VALUE		MEAN DIFFERENCE	CLASS INTERVAL
32.93	32.99		0.84	1.91
	32.99	26.38	6.61	1.91
32.93		26.38	6.55	1.91

Graphically present adjusted mean values of Breath Holding Time among groups of PP,BWG AND CG Among Sedentary woman.



Vijay Kumar ang group 2014 described that there has been an increasing interest in Pranayama breathing exercises which have been known to improve the quality of life. the effect of Bhastrika and Anulom Vilom Pranayam and Yogasana on heart rate variability, general wellbeing, and cognition and anxiety level of the medical students. 100 medical students were randomly divided into two groups. One group performed Bhastrika and Anulom Vilom Pranayam and the second Surayanamaskar for six weeks. The subjects were made to fill in PGI memory scale, Hamilton- anxiety scale and psychological general well-being schedule and record of the heart rate variability parameters was done, before and after six weeks of pranayam practice. The results showed highly significant increase in-high frequency (HF) components of heart rate variability and decrease in low frequency (LF) components and LF/ HF in the group practicing pranayam. There was also highly significant improvement of cognition, general well-being and anxiety as shown by the PGI memory scale, Hamilton-anxiety scale and psychological general wellbeing schedule score in this group. In yogasana group no significant changes were observed in the heart rate variability, cognition and anxiety although psychological general well-being schedule score significantly improved after six weeks of practice of yogasana. The study shows that practice of slow breathing type of pranayam for six weeks improves cognition, anxiety and general well-being and

increases the parasympathetic activity. Whereas there was no effect of the yogasana on the above parameters except improvements in the general well-being.

Shyam karthik and others 2014 Pranayama improved lung functions in numerous studies. Yoga involve isometric contraction and improves skeletal muscle strength. Yoga training improves the strength of expiratory as well as inspiratory muscles. The present study is planned to find the effect of pranayama on pulmonary functions in medical students. This study is conducted on 50 students doing 1st year M.B.B.S. Consent form has been taken from them. They have been given yoga training 30 min daily for 2 mnth under the guidance of a trained yoga instructor. Vital capacity (VC), Tidal volume (TV), Expiratory Reserve volume (ERV), Breath holding time (BHT), 40 mm endurance, Peak expiratory flow rate (PEFR) are measured before & after yoga training. VC has increased from 2972 ± 213.151 to 3372 ± 528.7722 . TV has increased from 496 ± 84.06347 to 588 ± 150.8863 . ERV also shows increase in values from 888 ± 183.303 to 1096 ± 386.7385 . BHT also shows increase in values from 33 ± 5.773503 to 58.6 ± 12.78019 . 40 mm endurance also shows increase in values from 30.8 ± 5.139715 to 53.52 ± 15.68736 . PEFR also shows increase in value from 388.8 ± 15.36229 to 425.2 ± 38.74274 . There is a statistically significant increase in all the above mentioned pulmonary functions following yoga training. Yoga practice can be advocated to improve pulmonary functions in healthy individuals and hence to prevent respiratory diseases in future.

Sukhdev Singh and others 2011 examined on “Effects of a 6-week nadi-shodhana pranayama training on cardio-pulmonary parameters” The aim of the study is to assess the effects of a 6-week nadi-shodhana pranayama training on cardiopulmonary parameters. A group of 30 male healthy subjects were selected from department of physical education (T), Subjects were assigned into two groups: A (experimental: N-15) and B (control: N-15). The subjects from Group A (experimental: N-15) were subjected to a 6-week nadishodhana pranayama training programme. This lasted 6 weeks and consisted of daily sessions, lasting 30 min. Heart rate was measured by counting radial pulse for a minute. Vital capacity was measured by spirometer. And also got better improvement pulmonary parameters like Breath holding time

Nishant Saxena , Dr. J. H. Vyas , Tejinder Khare . One should keep looking for healthy ways to manage the memory in student life, and develop lifelong habits that will help them achieve success. Yoga has gained in popularity in recent years because of its perceived benefits in reducing stress and improving concentration. The research aims to identify the effect of yoga exercises on concentration of some management students. Researcher used the experimental group, using design for one group by the pre and post measurement. Problems with concentration may be linked to various issues. Concentration while learning is a major problem in helping students with disabilities attains academic goals. The research would suggest the role of yoga in managing concentration of students. The further scope of the study is understanding role of yoga in managing stress in these students.

Bagavad GEETHA Mariappan 2014 Breath holding time is the time taken by the subject to hold his breath as long as he can. During voluntary breath holding, tissues continue to utilize oxygen and liberate carbon dioxide. Therefore during breath holding arterial pO₂ falls and pCO₂ rises. Since both these factors are powerful respiratory stimulants, a point is reached where the respiratory drive becomes so strong that the person cannot hold the breath any longer (1). The point at which breathing can no longer be voluntarily inhibited is called the breaking point. The breaking point is generally reached when alveolar pO₂ is 56 mm of Hg and alveolar pCO₂ is 49 mm of Hg. Either an increase in pCO₂ or a decrease in pO₂ stimulates central and peripheral chemoreceptors which in turn stimulate respiration through respiratory centers, thus influencing breath holding time.

Rajesh Kumar Sinha and Geetanjali Breath holding time is the time taken by the subject to hold his breath as long as he can. During voluntary breath holding, tissues continue to utilize oxygen and liberate carbon dioxide. The point at which breathing can no longer be voluntarily inhibited is called the breaking point that is generally reached when alveolar pO₂ is 56 mm of Hg and alveolar pCO₂ is 49 mm of Hg According to Guinness World Records Aleix Segura Vendrell of Barcelona, Spain, set the bar high at 24 minutes and 3 seconds in February 2016. The practice of pranayama / slow and deep breathing exercise. reduces the dead space ventilation and renews air throughout the lungs in contrast to only base of the lung in case of shallow breathing. Pranayama also prolong BHT and ventilatory function of the

lung. to know the impact of short breathing exercise on breath holding time among persons of age between 18 to 40. Cross sectional study, among 45 subjects of age between 18 -40 years BHT Was measured before exercise and after short term practice of deep breathing exercise. Breath holding time was increased in maximum subjects. It was increased to 46 secs in male population and 44.3 sec increase in female subjects. Average increase in Breath holding time was 15.84 sec while it was 12.25 sec in male and 11.56 sec in female. A regular practice of yoga /breathing exercise can be useful in increasing the ventilator functions.

Rachel Skowand group 2015 focused on “The ins and outs of breath holding: simple demonstrations of complex respiratory physiology.—The physiology of breath holding is complex, and voluntary breath-hold duration is affected by many factors, including practice, psychology, respiratory chemoreflexes, and lung stretch. In this activity, they outline a number of simple laboratory activities or classroom demonstrations that illustrate the complexity of the integrative physiology behind breath-hold duration. These activities require minimal equipment and are easily adapted to small-group demonstrations or a larger-group inquiry format where students can design a protocol and collect and analyze data from their classmates. Specifically, breath-hold duration is measured during a number of maneuvers, including after end expiration, end inspiration, voluntary prior hyperventilation, and inspired hyperoxia. Further activities illustrate the potential contribution of chemoreflexes through rebreathing and repeated rebreathing after a maximum breath hold. Specifically, breath-hold duration is measured during a number of maneuvers, including after end expiration, end inspiration, voluntary prior hyperventilation, and inspired hyperoxia. Further activities illustrate the potential contribution of chemoreflexes through rebreathing and repeated rebreathing after a maximum breath hold. The outcome measures resulting from each intervention are easily visualized and plotted and can comprise a comprehensive data set to illustrate and discuss complex and integrated cardiorespiratory physiology.

Hardman, and others 1992 Summary were of that study was to examine the influence of brisk walking on endurance fitness and the amount and distribution of body fat in previously sedentary women. Twenty-eight women Changes in endurance fitness were evaluated by measuring the oxygen uptake ($\dot{V}O_2$) at a reference blood lactate concentration of 2 mmol.l⁻¹. Two 1.61-km field tests of walking were completed, one at maximal speed and one at a "brisk" speed, as well as a 1.61-km walk on a motorised treadmill. The amount and distribution of body fat was determined by hydrostatic weighing and anthropometry and energy intake was evaluated using the 7-day weighed food intake method. Walkers completed an average of 157 min/week⁻¹ of brisk walking over the year. The following were increased in walkers, relative to controls: brisk walking speed [walkers 1.73 (0.05) m.s⁻¹ vs 1.88 (0.07) m.s⁻¹; controls 1.69 (0.05) m.s⁻¹ vs 1.70 (0.05) m.s⁻¹ at baseline and 12 months respectively, $P < 0.01$], maximal walking speed and $\dot{V}O_2$ at 2 mmol.l⁻¹. In addition, brisk walking reduced heart rate and blood lactate concentration during stepping as well as during standard, submaximal treadmill walking. It did not modify either the amount or the distribution of body fat, despite an unchanged energy intake.

Telles, such dev and others were in different continuous years of 7 years (2010-2017) period of Uninostril and alternate nostril breathing has been of special significance in Yoga, since the nostrils are said to represent the subtle energy channels known as *Nadis*. Right nostril corresponds to *Pingala Nadi*, and the left to *Ida*, respectively. Breathing through a single specific nostril is said to affect the human system differently. A study involving 51 volunteers demonstrated that the performance in a spatial task was significantly enhanced during left nostril breathing in both males and females, whereas non-significant increase was noted in the verbal task performance. Another study compared alternate nostril breathing with breath awareness. A significant increase was noted in the P300 peak amplitudes at different scalp sites along with a decrease in the peak latency at frontal scalp region, following alternate nostril Yoga breathing. Following breath awareness there was a significant increase in the peak amplitude of P300 at vertex region alone. Healthy experienced Yoga practitioners demonstrated an increase in Na-wave amplitude and decrease in latency during the period of *Pranayama* practice, whereas no alterations were observed in the Pa-wave. The *Pranayama* practice in the study involved consciously controlled rhythmic breathing with breath holding. A three arm randomized controlled trial done on patients with [essential hypertension](#), comparing the effects of *Nadishuddhi Pranayama* and breath awareness with control session for 10 min elucidated reduction in systolic and [diastolic blood pressure](#) following *Nadishuddhi* and improvement in [Purdue pegboard task](#) performance with both

hands and right hand. The Purdue pegboard task assesses manual dexterity and eye–hand co-ordination. Breath awareness group demonstrated reduction in [systolic blood pressure](#) when compared with control activity like reading magazine . The practice of uninostril breathing was also used clinically in cases of stroke, where practice of uninostril breathing for 10 weeks reduced anxiety in 11 post stroke cases and improved language measures in individuals with [aphasia](#) due to stroke [Marshall](#) and other 2013. Another case series on the use of forced uninostril breathing along with speech therapy for post stroke aphasia showed improvement in correct information unit and word productivity [Marshall](#) and his team 2014..

4. Conclusion

Pranayama practice and Brisk walking group advocated improved in concentration, pulmonary functions especially Breath holding time. there was significant improvement PP, BWG when compared with CG. These beneficial effect of pranayama The daily practice could also be parts of physical fitness and life style modification programs in maintaining better can be used as an adjuvant therapy for many respiratory diseases, in healthy individuals and hence to prevent lack of concentration. In conclusion, leading a healthy lifestyle is a conscious decision. One can ignore that and lead a life that exposes one to many health hazards. It is important to recognize that a healthy living ensures a longer life span as well as a life free of disease and complications.

References:

- Bagavad GEETHA Mariappan “Effect of physical training on breath holding time in Indian subjects” Indian Journal of Physiology and Pharmacology · December 2014; 58(1), : 108–109
- A. E. Hardman 1, P. R. M. Jones z, N. G. Norgan 2, and A. Hudson “Brisk walking improves endurance fitness without changing body fatness in previously sedentary women” Eur J Appl Physiol (1992) 65:354-359
- Mandanmohan*, Lakshmi Jatiya, Kaviraja Udupa And Ananda Balayogi Bhavanani *Corresponding Author Effect Of Yoga Training On Handgrip, Respiratory Pressures And Pulmonary Function “Indian J Physiol Pharmacol 2003; 47 (4) : 387–392
- Rajesh Kumar Sinha and Geetanjali “Impact of Short Term Breathing Exercise On Breath Holding Time” ISSN: 2320-5407 Int. J. Adv. Res. 8(08), 960-963
- Rachel J. Skow,Trevor A. Day,Jonathan E. Fuller,Christina D. Bruce, and Craig D. Steinback“The ins and outs of breath holding: simple demonstrations of complex respiratory physiology” Adv Physiol Educ 39: 223–231, 2015
- S. Telles, C. Joseph, S. Venkatesh, T. Desiraju “Alterations of auditory middle latency evoked potentials during yogic consciously regulated breathing and attentive state of mind”Int J Psychophysiol, 14 (1993), pp. 189-198
- Shyam karthik1 , M.Chandrasekhar2 , Kondam Ambareesha3 , Effect of Pranayama and Suryanamaskar on Pulmonary Functions in Medical Students” PJournal of Clinical and Diagnostic Research. 2014 Dec, Vol-8(12): BC04-BC06 C.Nikhil DOI: 10.7860/JCDR/2014/10281.5344
- Sukhdev Singh1 , Vishaw Gaurav1 * and Ved Parkash2 Journal of Physical Education and Sports Management Vol. 2(4), pp. 44-47, August 2011 Available online <http://www.acadjourn.org/jpesm> ISSN 1996-0794 ©2011 Academic Journals Full Length Research Paper
- Vijay Kumar B. A, Sachin Gudge, Mahesh Patil, Satish Mudbi, Siddeshwar Patil. “Effects of Practice of Pranayama on Control of Life Style Disorders”. Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 31, July 31; Page: 8712-8718, DOI: 10.14260/jemds/2014/3111.
- S. Telles, A. Yadav, N. Kumar, S. Sharma, N.K. Visweshwaraiah, A. Balkrishna “Blood pressure and Purdue pegboard scores in individuals with hypertension after alternate nostril breathing, breath awareness, and no intervention”Med Sci Monitor, 19 (2013), pp. 61-66
- R.S. Marshall, A. Basilakos, T. Williams, K. Love-Myers”Exploring the benefits of unilateral nostril breathing practice post-stroke: attention, language, spatial abilities, depression, and anxiety”J Altern Complement Med, 20 (2014), pp. 185-194
- R.S. Marshall, J. Laures-Gore, M. DuBay, T. Williams, D. Bryant”Unilateral forced nostril breathing and aphasia – exploring unilateral forced nostril breathing as an adjunct to aphasia treatment: a case series”J Altern Complement Med, 21 (2015), pp. 91-99
- S. Muktibodhananda”Hatha yoga Pradipika: light on hatha yoga”(2nd ed.), Yoga Publication Trust, Bihar (2002)
- H.R. Nagendra”Pranayama – the art and science Swami Vivekananda Yoga Prakashana, Bangalore (2007)
- S.A. Jella, D.S. Shannahoff-Khalsa “The effects of unilateral forced nostril breathing on cognitive performance”Int J Neurosci, 73 (1993), pp. 61-68
- S. Telles, N. Singh, R. Puthige “Changes in P300 following alternate nostril yoga breathing and breath awareness”Biopsychosoc Med, 7 (2013), p. 11

