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Effect of bhastrika pranayama on selected physiological variables among schools girls

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Abstract
The objective of the study was to find the effect of six weeks bhastrika pranayama training on physiological variables among school girls. For the purpose of the study twenty four (24) school girls from Government High School Sarangpur, Chandigarh was selected. The age of the subject ranged between 14-15 years. Total numbers of subjects were divided into two groups i.e. experimental group (12) and control group (12). Experimental group was given Bhastrika Pranayama, control group was not given any kind of training. The training programmed was scheduled for 6 weeks by the researcher. It was 45 minutes pranayama training for 5 days in a week. All groups were pre and post tested on physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate and respiratory rate). The data was analyzed by employing pair 't'-test. The level of significance was set at 0.05. Statistical on gathered data showed that there were significant differences found on vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate and respiratory rate. The control group showed no significant differences found on physiological variables.

Keywords: bhastrika pranayama, physiological variables, school girls

Introduction
"Extension of prana is known as pranayama". Pranayama is a Sanskrit word, which define "breathe control". The word pranayama is composed by two Sanskrit words, the first is *Prana* which means *"life force (particularly as the breath)"*and the second word is *ayama* which define to *"control the prana"*. It is a kind of yogic discipline with origin *(Asana, Pranayama, Mudra, Banda).* Pranayama is a kind of breath exercise, it clear the physical and emotional obstacles from our body. Breath is an essential activity of our body to live (Ali Ashraf, 2005). There are different techniques to do Pranayama, first doing pranayama by sitting down with an upright spine like Padmasans. Other techniques of doing Pranayama are known as Kapalbhati, Nadishodhan (Anulom – Vilom), Ujjayi and Bhastrika. The best time for doing Pranayam is in the morning with empty stomach (Esther Ekhart, 2014). Pranayama should be done after the purification of Nadis. Gheranda says: "Vayu cannot enter the Nadis so long as they are full of impurities. Therefore, the first nadi should be purified". The purification of nadis is of two sorts Samanu and Nirmanu. Samanu is done by mental process with bija-Mantra. The Nirmanu is performed by physical cleanings (Kaul, 1991).

Bhastrika" comes from Sanskrit which means "bellows". It is known as bellows breathing because like a blacksmith's bellow air is drawn powerfully in and out of the lungs. Bellows are used to fan the fire in order to generate more heat. Bhastrika is a kind of pranayama. It is a simple breathing exercise *(Yoga Darshan).* In ancient yogis they called this breathing exercise as "the yoga breath of fire" (Sarvyoga, 2015). Bhastrika pranayama increases the flow of air within the body and fans the inner heat which burns the impurities. There are many sitting postures in which we can perform bhastrika pranayama like padmasans and siddhasana etc *(Yoga Darshan).* While in the bharstrika pranayama inhalation and exhalation both are forced. There are two different techniques for bhastrika pranayama. One is predicated on the classical approach given with in Hatha yoga Pradipika. Other is a modern and changed version of the technique and involves the movement of the arms and shoulder alongside the breath (Sarvyoga, 2015). This exercise helps to decrease the level of carbon dioxide in our body, useful for the patients of lung disorder. It helps our nervous system to do work properly, produce heat in our body which burn up toxins and wastes from our body (asana, pranayama, mudra, bandh), gives strength to lungs. Bhastrika pranayama is helpful in allergies, asthma, respiratory diseases, tonsil and thyroid, purifies the blood and removes the toxins from the body. Bhastrika pranayama is the best way for gaining enlightenment and tranquility (Sarvyoga, 2015).

Objective of the Study
To find out the effect of six weeks bhastrika pranayama on some selected physiological variables among school girls.

Method and Procedure
In this experimental study, we study about pre and post experimental design. For this, purposive sampling technique was adopted. For the purpose of the study 24 school girls from Government High School Sarangpur, Chandigarh was selected. Total numbers of subjects were divided into two groups i.e. experimental and control groups. Each group

consisted of 12 students. The age of the students ranged from 14 to 15 years. The training programmed was scheduled for 6 weeks by the researcher. It was 45 minute pranayama training for 5 days in a week. Experimental group were given a warm up session, in which the groups use to perform pre-yogic and yogic breathing exercise. During the first week, all the experimental groups were given training on natural breathing, abdominal breathing, thoracic breathing, clavicle breathing, pre yogic breathing technique with hands movements and proper yogic breathing technique. All groups were pre and post tested on physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate and respiratory rate).

Criterion Measures

Table 1

S. No	Variables	Test/Tool	Units
1	Vital Capacity	Peak Flow Meter	Liters
2	Systolic Blood Pressure	Sphygmomanometer, Stethoscope	mmhg
2	Diastolic Blood Pressure	Sphygmomanometer, Stethoscope	mmhg
4	Breath Hold Capacity	Stop Watch	breath hold/min
5	Resting Pulse Rate	Stop Watch	Beats/min
6	Respiratory Rate	Stop Watch	Breath/min

Bhastrika Pranayama

Table 2

Steps	Technique	Posture	Times
Step-I	Yogic breath	Ardh padamasana	20
Step-II	Ratio of inhalation and exhalation 1:1sec. forcefully	Ardh padamasana	60
Step-III	Ratio of inhale and exhale 1/2:1/2 sec.	Vajrasana	120

Fig 1: Illustrations of Measuring Peak Flow Rate and Blood Pressure

Fig 2: Illustrations of Measuring Breath Hold Capacity and Respiratory Rate

To compare the mean differences between the initial and final i.e. pre-test and post-test scores of experiment group and control group, pair 't'-test was applied with the help of SPSS software to find out the effects of Bhastrika Pranayama on physiological variables among school girls of Government High School, Sarangpur and level of significance chosen was 0.05.

Results and Findings

The comparison of initial and final scores on physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate and respiratory rate) for experimental group is presented in table-3.

Table 3: Comparison of Pre Test and Post Test Scores for Bhastrika Pranayama on the Physiological Variables

Variable	Group	N	Mean	SD	SE	MD	't'
Vital Capacity	Pre-Test	12	313.33	51.93	14.99	52.50	2.455*
	POST-TEST	12	365.83	52.82	15.24		
Systolic Blood Pressure	Pre-Test	12	114.91	8.26	2.38	14.25	3.868*
	POST-TEST	12	100.66	9.72	2.80		
Diastolic Blood Pressure	Pre-Test	12	73.66	7.88	2.27	7.08	2.225*
	POST-TEST	12	66.58	7.70	2.22		

Breath Hold Capacity	Pre-Test	12	28.41	7.21	2.08	38.91	4.115*
	POST-TEST	12	67.33	31.95	9.22		
Resting Pulse Rate	Pre-Test	12	92.33	10.58	3.05	13.00	3.327*
	POST-TEST	12	79.33	8.43	2.43		
Respiratory Rate	Pre-Test	12	20.16	5.25	1.51	8.166	4.670*
	POST-TEST	12	12.00	3.01	.870		

*Significant at 0.05 level
't' $_{0.05}$ (22) = 2.074

The comparison of pre-test and post-test scores on physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate and respiratory rate) for control group is presented in table-4.

Table 4: Comparison of Pre Test and Post Test Scores for Control Group on Selected Physiological Variables

Variable	Group	N	Mean	SD	SE	MD	't'
Vital Capacity	Pre-Test	12	291.66	31.57	9.11	23.33	1.984
	POST-TEST	12	315.00	25.76	7.43		
Systolic Blood Pressure	Pre-Test	12	118.41	7.166	2.068	.08	.033
	POST-TEST	12	118.33	4.886	1.410		
Diastolic Blood Pressure	Pre-Test	12	67.83	8.06	2.32	2.50	.856
	POST-TEST	12	70.33	6.11	1.76		
Breath Hold Capacity	Pre-Test	12	28.66	6.94	2.00	4.75	1.728
	POST-TEST	12	33.41	6.51	1.88		
Resting Pulse Rate	Pre-Test	12	96.75	13.18	3.80	8.08	1.411
	POST-TEST	12	88.66	14.83	4.28		
Respiratory Rate	Pre-Test	12	19.58	5.71	1.64	1.75	.715
	POST-TEST	12	17.83	6.26	1.80		

*Significant at 0.05 level
't' $_{0.05}$ (22) = 2.074

From the gathered data and analysis it was revealed that six weeks Bhastrika Pranayama Training module significantly increase vital capacity which mean, it increase intra-thoracic pressure and blood from the lung squeezed into the heart which was supported by the study conducted by Bhatnagar, *et al*. (2015) and Bal, S.B, *et al*. (2015). Blood pressure and resting pulse rate were found significant differences which mean bhastrika pranayama training module decreases blood pressure and resting pulse rate in girls and make them felt calmness and balance of mind, thus supporting the parasympathetic situation. The breath hold capacity and respiratory rate were found positively effect as they found significant differences which make easier for the lung to function, improve the exchange of oxygen and carbon dioxide and also increase lung capacity. It was supported by the study conducted by Jainoddin (2015) [4] and Bhadoria (2014).

Conclusions

1. There were significant differences found on physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate and respiratory rate) among school girls.
2. Six week Bhastrika Pranayama is effective training module on vital capacity, diastolic blood pressure, breath hold capacity, resting pulse rate and respiratory rate.
3. The control group showed no significant differences found on physiological variables.

References

1. Bal BS. Effect of anulom vilom and bhastrika pranayama on the vital capacity and maximal ventilator. Journal of Physical Education and Sport Management. 2010; 1(1):11-15, Retrieved form http://www.acadjourn.org/jpesm
2. Bhargava R, Gogate MG, Mascarenhas JF. Autonomic responses to breath holding and its variations following pranayama. Indian Journal of Physiology and Pharmacology. 1988; 32(4):257-264.
3. Bhole MV, Karamkelkar PV. Effect of Yoga Training on Vital Capacity and Breath Holding Time. Yoga Mimana. 1971; 15.19-26.
4. Jainoddin UG. Effects of pranayama on cardio respiratory function and psychological efficiency of tribal students in government ashram high school. Ph.D. thesis, Faculty of Education, Shri Jagdish Prasad Jhabarmal Tibarewala University, 2015. http://hdl.handle.net/10603/44619
5. Patil YR, Sawant RS. Study of effects of Bhastrika pranayama on pulmonary function. International research journal of pharmacy. 2012; 3(3). Retrieved from www.irjponloine.com.