International Journal of Physical Education, Sports and Health 2017; 4(2): 324-326

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2017; 4(2): 324-326

www.kheljournal.com
Received: 15-01-2017
Accepted: 16-02-2017

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Effect of pranayama on breath holding capacity, heart rate and exhale capacity of colligate students

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Abstract
The purpose of the present study was to find out the effect of Pranayama on breath holding capacity, heart rate and exhale capacity of colligate students. For the purpose of the study college male students were selected at random from Colleges, Amravati (Maharashtra) India. They were studying in the college around Amravati and their age ranges from 18 to 25 years. Eighty male selected as subjects for this study. All the subjects were divided into two groups consisting of forty subjects each. The Subjects was selected by using simple random sampling method. Stop watch was used to measure the Breath holding capacity, Stethoscope was used for counting the heart rate of the subjects and Peak Flowmeter was used to measure the exhale capacity. The data thus collected were put to statistical treatment computing independent't' test to find out the differences, if any between the pre and posttest. Further the level of significance was set at 0.05. In this research it is observed that there has been significance difference between the pre and posttest experimental group in breath holding capacity, heart rate and exhale capacity. There has been not significance difference between the pre and posttest control group in breath holding capacity, heart rate and exhale capacity. This study indicated that regular pranayamas is beneficial for human health and future generation.

Keywords: Pranayama, breath holding capacity, heart rate, students

Introduction
Prana is the life force and energy that sustains all living things. As you breathe, prana flows throughout the cells in your body, making you strong and healthy. The goal of breathing efficiently is to balance the prana in your body and open areas that may be blocked. Visualizing this flow of energy helps to focus your mind and improve your awareness of the flow of prana in your body. Three Part Breath exercise strengthens your chest, lung and diaphragm muscles, while increasing your lung capacity. Also called Full Yogic Breath or Complete Yoga Breath, practicing this exercise can also calm your mind and relax your body. You should be comfortable performing the abdominal breath exercise. This abdominal breath exercise improves your ability to breathe more fully and deeply by increasing the air flow to the lower part of your lungs. You may also find that this exercise helps to calm and relax your body and mind. As you perform this exercise, you should become aware of the rise and fall of your breath in your abdomen. As you breathe, make sure you do not tighten your abdominal muscles or press your abdomen outward. Your abdomen should expand naturally and remain soft throughout the exercise.

Methodology
Source of Data
For the purpose of the study college male students were selected at random from Colleges, Amravati (Maharashtra) India. They were studying in the college around Amravati and their age ranges from 18 to 25 years.

Selection of Subjects
Eighty male selected as subjects for this study. All the subjects were divided into two groups consisting of forty subjects each.

Sampling Method
The Subjects was selected by using simple random sampling method.

Equipment used for Collection of Data
Under given equipments was used for the collection of data.

1. **Breath holding capacity**: Stopwatch was used to measure the breath holding capacity.
2. **Heart rate**: Stethoscope was used for counting the heart rate of the subjects.
3. **Exhale capacity**: Peak Flowmeter was used to measure the exhale capacity.

Pranayama Programme Design
Twelve weeks of pranayama programme were given to the experimental group. The control group was not allowed to participate in any of the programes, except their routine physical education classes. Measurements for the variables were taken at the beginning (pre - test) and at the end of the experimental period, after twelve weeks (post - test) the data were collected for all the variables from both control and experimental groups, for five days. During this period the subject were not allowed to participate in any training.

Table 1: Practice Schedule

Weeks	Pranayamas	Pranayama Times
I & II	Kapalabhati	10
	Nadi sudhi	
	Sitali	
Relaxation	Savasana	5
III & IV	Kapalabhati	15
	Nadi sudhi	
	Sitali	
Relaxation	Savasana	5
V & XII	Kapalabhati	20
	Nadi sudhi	
	Sitali	
	Suryabhedana	
	Ujjayi	
Relaxation	Savasana	5

Analysis of the Data
Result and Discussion
The data thus collected were put to statistical treatment computing independent‘t’ test to find out the differences, if any between the pre and posttest. Further the level of significance was set at 0.05.
The findings of the study have been presented in table- 2

Table 2: Mean, standard deviation and ‘t’ ratio of breath holding capacity between pre and posttest of experimental and control groups

Variable	Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Breath Holding capacity	Experimental	Pre	16.83	2.08	0.54	7.75	14.39*	78	2.02
		Post	24.58	2.69					
	Control	Pre	17.33	2.94	0.66	0.63	0.96	78	2.02
		Post	17.96	2.94					

Table-2 shows that the significant difference in breath holding capacity between pre and posttest experimental group. The obtained‘t’ value of 14.39 is more than the table value of 2.02 with 78 degree of freedom.

Table-2 shows that the insignificant difference in breath holding capacity between pre and posttest control group. The obtained‘t’ value of 0.96 is less than the table value of 2.02 with 78 degree of freedom.

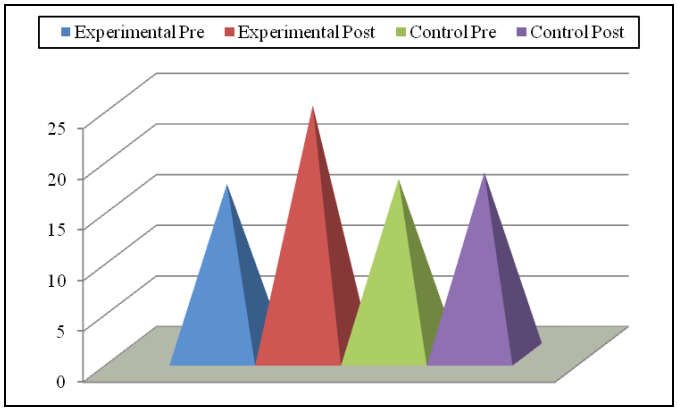

Fig 1: Mean of breath holding capacity between pre and posttest of experimental and control groups

Table 3: Mean, standard deviation and ‘t’ ratio of heart rate between pre and posttest of experimental and control groups

Variable	Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Heart Rate	Experimental	Pre	71.9	2.33	0.5	1.23	2.46*	78	2.02
		Post	70.68	2.13					
	Control	Pre	71.63	2.01	0.5	0.1	0.20	78	2.02
		Post	71.53	2.42					

Table-3 shows that the significant difference in heart rate between pre and posttest experimental group. The obtained ‘t’ value of 2.46 is more than the table value of 2.02 with 78 degree of freedom.

Table-3 shows that the insignificant difference in heart rate between pre and posttest control group. The obtained ‘t’ value of 0.20 is less than the table value of 2.02 with 78 degree of freedom.

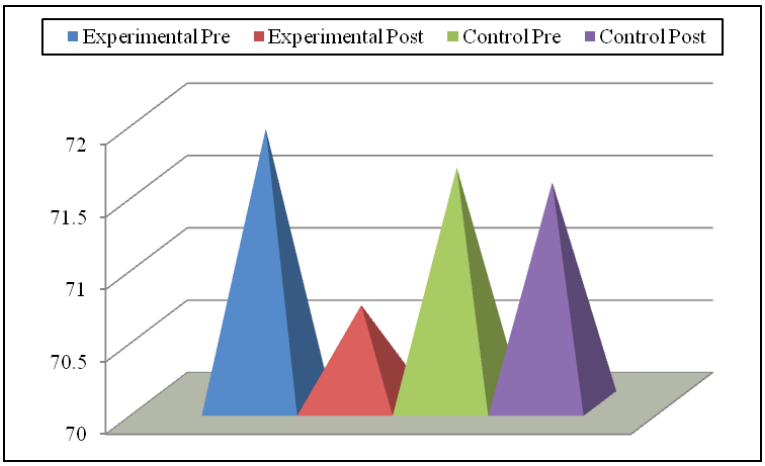

Fig 2: Mean of heart rate between pre and posttest of experimental and control groups

Table 4: Mean, standard deviation and 't' ratio of exhale capacity between pre and posttest of experimental and control groups

Variable	Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Exhale Capacity	Experimental	Pre	286.4	40.15	8.06	41.63	5.16*	78	2.02
		Post	328.03	31.45					
	Control	Pre	327.78	41.06	8.46	8.27	0.98	78	1.99
		Post	319.5	34.34					

Table-4 shows that the significant difference in exhale capacity between pre and posttest experimental group. The obtained't' value of 5.16 is more than the table value of 2.02 with 78 degree of freedom.

Table-4 shows that the insignificant difference in exhale capacity between pre and posttest control group. The obtained't' value of 0.98 is less than the table value of 2.02 with 78 degree of freedom.

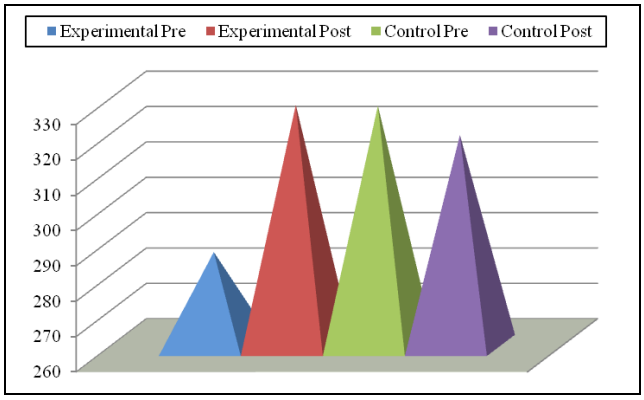

Fig. 3: Mean of exhale capacity between pre and posttest of experimental and control groups

Conclusion

Within the limitations of the present study and on the basis of the findings the following conclusions were drawn. Pranayama is an exact science. It is the regulation of breath or control of prana which is the stoppage of inhalation and exhalation,that follows after securing that steadiness of posture or seat, Asana. As the Bible states, "Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living being. In this research it is observed that there has been significance difference between the pre and posttest experimental group in breath holding capacity, heart rate and exhale capacity. There has been not significance difference between the pre and posttest control group in breath holding capacity, heart rate and exhale capacity. This study indicated that regular pranayamas is beneficial for human health and future generation.

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