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**Dr. Badshah Ghosh**

Asst. Prof. Panskura Banamali  
College, Panskura R.S. Purba  
Medinipur, West Bengal, India

## Role of yogic asanas and kriyas on physiological variables of physical education students

**Dr. Badshah Ghosh**

### Abstract

The purpose of the study was to investigate the role of yogic asanas and kriyas on physiological variables of physical education students. The subjects for this study were thirty male bachelors of physical education students of Panskura Banamali College, Purba Medinipur, West Bengal. The subjects were equally divided into three groups namely two experimental and one control group. The two experimental treatments were assigned at random to two groups i.e. one for Asanas and another for Pranayama a yogic kriya and the third group served as control group. The treatment schedule was prepared for twelve weeks. The experimental treatments were employed for 45 minutes a day in five days a week for twelve weeks duration. Pre and post-test data of all the subjects from three groups were collected before and after the experimental treatment. The data was analyzed by employing analysis of covariance at the 0.05 level of significance. The result of the study indicates that practice of both Asanas and Pranayama had significant effect on Peak Heart Rate and Vital Capacity of the subjects.

**Keywords:** Cardio respiratory variables, asanas and pranayama

### 1. Introduction

The classical techniques of Yoga date back more than 5,000 years. In ancient times, the desire for greater personal freedom, health and long life, and heightened self-understanding gave birth to this system of physical and mental exercise which has since spread throughout the world. The word Yoga means “to join or yoke together,” and it brings the body and mind together into one harmonious experience.

Asanas are the static posture accredited with values of promoting physical fitness. Element of exertion with characteristics other physical exercises is eliminated in the system of asanas. Asanas have been classified into meditative and cultural poses. The aim of cultural poses is to produce a state of physiological balance in the human body so that it can possess the best organic vigor. Yogic Asanas help in the prevention and cure of many physical diseases, especially those of the digestive tract by regulating the secretion of various duct and ductless gland. Apart from all these yoga is an extremely economic practice.

Pranayama is an art and has techniques to make the respiratory organs to move and expand intentionally, rhythmically and intensively. It consists of long, sustained subtle flow of inhalation, exhalation and retention of breath. Puraka stimulates the system, Rechaka throws out vitiated air and toxins; Kumbhaka distributes the energy throughout the body. The movements include horizontal of the lungs and the ribcage. This disciplined breathing helps the mind to concentrate and enables the practitioner to attain robust health and longevity (Gore and Gharote, 1986) [6].

The word Kapalbhata consist of two words, kapal meaning skull (here, skull includes all the organs under the skull too) and bhata means shining, illuminating. Bhata is light or splendor but it also means perception and knowledge. The scientific word published on this practice is related to the composition of alveolar air, breath holding time and urinary output as influenced by this practice. Kapalbhata is a technique of incessant abdominal breathing included in the practices of yoga. The Kapalbhata impulsive force is applied with Greater Magnitude while the stroke time is very small (Ghosh and Choudhary, 2014) [4]. Many studies have been done to highlight the positive effect yoga; this study was an attempt to find out the effect of certain yogic asanas and pranayam on some physiological variable of sedentary youths.

**Correspondence**

**Dr. Badshah Ghosh**

Asst. Prof. Panskura Banamali  
College, Panskura R.S. Purba  
Medinipur, West Bengal, India

**1.1 Objective of the Study**

The purpose of the study was to investigate the role of yogic asanas and kriyas on physiological variables of physical education students.

**1.2 Hypothesis**

It was hypothesized that there would be significant changes in the selected physiological variables of the subject who were sedentary in nature, after the training of twelve weeks.

**2. Methodology**

The purpose of the study was to investigate the effect of asanas and pranayama on selected physiological variables of the students. The investigator was more interested to find the effect of asanas and pranayama particularly on the physical education students who had been taking part in various physical activities.

**2.1 Subjects**

Thirty students of bachelor of Physical Education were selected from Panskura Banamali College, Purba Medinipur, West Bengal. The age of the subjects ranged between 17 – 25 years. The subjects were divided into three equal groups and the distribution was done randomly. Two experimental groups were (N=10 each) namely Asanas (G1) and Kapalbhathi (G2) and the third group served as control group (G3).

**2.2 Treatment**

The training schedule was prepared for twelve weeks. The practice schedule included 12 asanas for asanas group initiated and ended with Surya Namaskar asanas and the only

one pranayama chosen for the study was Kapalbhathi for the pranayama group. However, the pranayama group performed Anuloma- Viloma at the beginning of the Kapalbhathi and also in between for the relaxation between each sets. Only those asanas were selected who plays direct role on the cardio respiratory system. The experimental treatments were employed for 45 minutes a day in five days a week for the period of twelve weeks. The third group served as control groups (G3).

**2.3 Collection of Data**

Cardio respiratory variables chosen for the study were Peak Heart Rate and Vital Capacity. Standard test and measurement procedures were adopted to collect data for the study. The Vital capacity was measured with the help of dry spirometer. The peak heart rate was measured after putting the subjects at sub maximal work load. To assess the sub maximal work load a pilot study was done for find out the height of the bench and the number of steps per minute. The subjects were asked to perform step up test to assess the peak heart rate. The Pre and post test data of all the subjects from three groups were collected before and after the experimental period of twelve weeks. The data was analyzed by employing analysis of covariance at the 0.05 level of significance.

**3. Finding**

In order to identify the significant differences among three groups on selected variables, collected pre and post training were analyzed using the analysis of covariance. The findings of the study have been presented with the help of following tables.

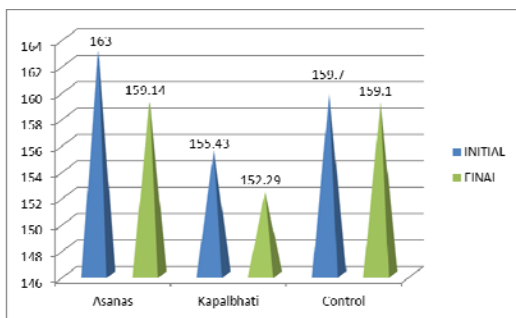
**Table 1:** Analysis of Covariance for Peak Heart Rate

	Asanas	Kapalbhathi	Control	S.V	df	SS	Mss	F-Ratio
INITIAL	163	155.43	159.7	Among Group	2	201.81	100.90	2.95
				Within Group	18	867.12	48.17	
FINAL	159.14	152.29	159.1	Among Group	2	219.43	109.71	1.67
				Within Group	18	1197.12	66.50	
ADJUSTED	155.03	154.78	158.8	Among Group	2	47.46	23.73	5.26*
				Within Group	17	77.23	4.54	

F(2,17) = 3.59

F(2,18) = 3.55

\*Significant at 0.05 levels.



**Fig 1:** Mean Value of Asana, Pranayama and Control Groups with respect to peak Hearts Rate

The table-1 of analysis of covariance for peak heart rate of asanas and kapalbhathi and control group indicated in significant F-ratio of 2.95 and 1.67 for the initial and final test of means respectively. However, the F-ratio for the adjusted final test mean reveal a value of 5.26 which was significant as it was greater than the F-value of 3.59 required for significant at 0.05 level. This indicates that there was significant difference from the adjusted final means of Asanas, Kapalbhathi and control groups in the Peak heart rate.

**Table 2:** Paired Adjusted Final Mean and Difference between Means of Three Different Groups of Peak Heart Rate

Mean			Mean Difference	Critical Difference
Asana	Kapalbhathi	Control		
155.03	154.78		0.25	3.05
155.03		158.8	3.77*	3.05
	154.78	158.8	4.02*	3.05

Table-2 indicates that the difference between the paired adjusted final means of Asanas, Kapalbhathi and control groups in peak heart rate indicated significant value of 3.77\*

and 4.02\* which emphasis greater mean gain observed for Asanas, Kapalbhathi as compared to the control group.

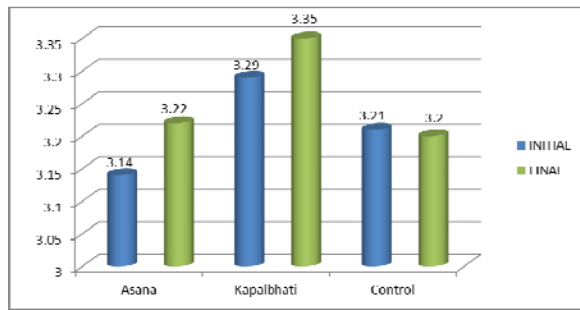
**Table 3:** Analysis of Covariance for Vital Capacity

	Asana	Kapalbhathi	Control	S.V	df	SS	Mss	F-Ratio
Initial	3.14	3.29	3.21	Among Group	2	0.07	0.03	2.03
				Within Group	18	0.32	0.01	
Final	3.22	3.35	3.20	Among Group	2	0.09	0.04	1.98
				Within Group	18	0.42	0.02	
Adjusted	3.29	3.28	3.21	Among Group	2	0.02	0.01	8.61*
				Within Group	17	0.02	0.00	

F (2, 17) =3.59

F (2, 18) =3.55

\*Significant at 0.05 levels.



**Fig 2:** Mean Value of Asana, Pranayama and Control Groups with respect to Vital Capacity

The table-3 of analysis of covariance for vital capacity of Asanas, Kapalbhathi and Control group indicated insignificant F-ratio of 2.03 and 1.98 for the initial test and final test of means respectively. However, the F-ratio for the adjusted final test mean reveal a value of 8.61\* which was significant as it was greater than the F-value of 3.59 required for significant at 0.05 level. This indicates that there were significant differences from adjusted final means of Asana, Kapalbhathi and Control groups in the vital capacity.

**Table 4:** Paired Adjusted Final Mean and Difference between Means of Three Different Groups of Vital Capacity

Mean			Mean Difference	Critical Difference
Asana	Kapalbhathi	Control		
3.29	3.28		0.01	0.06
3.29		3.21	0.08*	0.06
	3.28	3.21	0.07*	0.06

Table-4 indicates that the difference between the paired adjusted final means of Asanas, Kapalbhathi and control group in vital capacity indicated significant value of 0.08 and 0.07\* which emphasis greater mean gain observed for Asanas and Kapalbhathi group as compared to the control group.

**4. Conclusion**

On the basis of result of the study following conclusions are drawn:

1. Both Asanas and Kapalbhathi Pranayama had significant contributing role over the Peak Heart rate of subjects as a result of twelve weeks yogic training.
2. It can be said that the effect of twelve weeks practice of Asanas and Kapalbhathi Pranayama was significant enough to bring about the change in the vital capacity.

**5. Recommendation**

The twenty first century started as the era of technology then with the advancement new names added to the list like remote era, button era but people have started calling this era as the era of touch. But the advancement of technology the people have started alienating from physical labor and started leading more and more sedentary life style. This life style leads to hypokinetic disease. It has been advised by all the yoga experts to practice yoga asanas and pranayama for healthy and disease free life. The practice of yoga can be done at any time of the day and at any place and people get great benefit from this and the result of the study also suggest the same.

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