

## **Effect of Pranayama and Physical Exercises on Selected Physiological Variables Among Secondary School Children**

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### **Abstract**

*The subjects were taken from Government Secondary Schools of Bengaluru North District. The age of the subjects chose ran between 14 to 17 years. The subjects were not performing any type of pranayama and specific physical exercises before. The subjects not involved in any other physical activity while the present study is being conducted. Focus of the study was on the development of physical and physiological variables among secondary school children.*

*The subjects were partitioned into four equivalent gatherings of 45 each out of 180 subjects.*

### **Keywords**

1. Control Group - no training will be given
2. Pranayama Group - Experimental Group-I
3. Physical Exercises Group - Experimental group-II
4. Pranayama+Physical Exercises Group – Experimental Group-III

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## **INTRODUCTION**

After a deep study many are concerned with the view that Pranayama and physical exercises could bring them together and help them to overcome the variables with regards to their physique and physiology.

Prana is the basic fabric of whole creation and it is the hard core of all creations. Prana means breathe and ayama means control expansion. Pranayama means a systematic and rhythmic breathing. Prana is just as like as dear child to a responsible father. Pranayama is the science of breathe to gain control over prana and in mind. Pranayama as characterized by Yoga Sutra of Patanjali is the investigation of purifying, adjusting and picking up control over the prana in the human framework.

## **PHYSIOLOGY**

Pranayama have a wide physiological values, while performing pranayama with proper Puraka Rechaka and Kumbhaka. The abdominal muscles are being compressed and relaxed due to proper abdominal contraction and relaxation. Our digestive power enhances and the spinal column lower portion is pulled up. To pull up the upper portion of the spinal column we use different pranayama techniques. This pulling up of whole vertebral column activates and stimulates the nerves of the body i.e., activate the nervous system.

## **METHODOLOGY**

### **STATEMENT OF THE PROBLEM:**

The purpose of the study was entitled EFFECT OF PRANAYAMA AND PHYSICAL EXERCISES ON SELECTED PHYSIOLOGICAL VARIABLES AMONG SECONDARY SCHOOL CHILDREN

### **SIGNIFICANCE OF THE STUDY:**

The current study may be significant as follows.

1. The study may help to know the variations and similarities in Pranayama and Physical exercises on physical variables namely Flexibility, Agility, Abdominal Strength and Speed and physiological variables Vital Capacity and Cardiovascular endurance among secondary school children.
2. The results of the study would be of more interest to pranayama and physical exercises to the physical educators, yoga therapists, athletes, trainers and physiologists as they would be able to estimate the difference in physical and physiological parameters for efficient performance.
3. The results of the study will also play a vital role in designing & administering physical exercises and pranayama camps for those who need such special attention.

### **HYPOTHESES:**

In view of the accessible written works, the accompanying speculations

were encircled.

1. It was conjectured that there might be noteworthy change on those Physical Variables to be specific Flexibility, Agility, Abdominal Strength & Speed and Reaction of secondary school children by practicing of Pranayama, Physical exercises and Pranayama and Physical Exercises groups.

2. It was theorized that there might be critical change on chosen Physiological Variables namely Vital Capacity and Cardio-vascular Endurance of secondary school children by practicing of Pranayama, Physical exercises and Pranayama and Physical Exercises groups.

#### **DELIMITATIONS :**

The present study was delimited in the accompanying ways:

1. The study was delimited to a total of 180 secondary school boys.

2. The study was delimited to age group of 14-17 yrs

3. The study was delimited to 60 training classes. Six days a week.

4. The randomly selected 180 subjects from two different schools were divided into control gathering of 45 understudies, test groups: Group-1: Pranayama Group-45 students; Group-2: Physical Exercise group - 45 students; and group-3: Pranayama + Physical Exercise Group - 45 students.

5. The experimental treatments of pranayama, physical exercises and the combined were given for the duration of 10 weeks was considered sufficient to indicate selected physical and physiological variables changes, if any.

#### **Physiological Variables:**

a. Vital capacity

b. Cardiovascular endurance

#### **LIMITATIONS :**

The following factors were considered as limitations in the study:

1. The study is limited to the higher secondary school children of selected secondary schools of Gulbarga district only.

2. The subjects who are practicing in pranayama and Physical exercises at present and earlier days will not be taken into consideration.

#### **Dependent Variables :**

Physiological Variables:

1. Vital Capacity

2. Cardio-vascular Endurance

#### **Independent Variable for test Practice:**

Pranayama

1. Kapalabati
2. Nadhanusandhana

### **RELIABILITY OF DATA**

Before conducting the test, the researcher discussed about testing procedure with concerned pranayama experts at Sri Vivekananda Yoga Kendra, Jigani, Bengaluru, Karnataka and other related persons, got sufficient knowledge to administer the test.

#### **PRANAYAMAS (BREATHING EXERCISES)**

1. KAPALABHATI ; It is a breathing exercise which shines our brain (Kapala) It is process of inhalation & exhalation rapidly as like blacksmith bellows.

Generally all the living beings inhale actively exhale passively whereas in the process of kapalabhati this occurs vice-versa. Perform exhalation and inward breath quickly like the howls of blacksmith. This is called Kapalabhati and it destroys all mucus disorders.

#### **2. NADHANUSANDHANA**

The word Nada is originated from the root 'nud' which means shabda or sound and anusandhana means exploration or search of sound according to Sanskrit language. Nada is of two types.

1. Ahata Nada: is produced by striking of two things i.e, through contact of vocal organs with outer air.
2. Anahata Nada: is produced spontaneously without any striking of two things. Rhythmic flow of subtle eternal sound and self existent.

#### **PHYSIOLOGICAL VARIABLES:**

##### **1. Vital Capacity Test 95: Reason :**

The motivation behind the test was to quantify the Vital Capacity of the students.

##### **2. Harvard Step Test Reason:**

The motivation behind the test was to quantify the Cardio-vascular Endurance of the subjects.

#### **STATISTICAL TECHNIQUES USED FOR DATA ANALYSIS:**

Use of suitable technique is indispensable in the analysis of data. The various techniques help in analysis interpretation and drawing of inferences.

#### **PHYSIOLOGICAL VARIABLES**

##### **1. Vital Capacity [Wet Spirometer]**

The data on vital capacity before and after the Pranayama and Physical Exercises, Physical Exercises and Pranayama training of experimental group & control groups were analyzed & presented in Table-1.

#### **ANALYSIS AND INTERPRETATION**

**Table-1**  
**Table showing paired sample statistics for Vital Capacity.**

<b>Group</b>	<b>Test</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>
Pranayama + Physical Exercises Group	Pre Test	45	1966.666	490.361
	Post Test	45	2240.000	494.239
Physical Exercises Group	Pre Test	45	1977.777	442.559
	Post Test	45	2133.333	411.758
Pranayama Group	Pre Test	45	1971.111	531.986
	Post Test	45	2271.111	567.939
Control Group	Pre Test	45	1902.222	358.968
	Post Test	45	1931.111	351.504

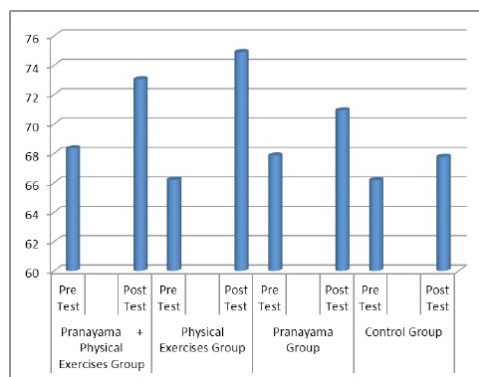
From the above table-1, it is observed that in experimental groups the Vital Capacity pre test mean score is 1966.666, which has increased to the mean scores of 2240.000 in post test in Pranayama and Physical Exercises group, the Vital Capacity pre test mean score is 1977.777, which has increased to the mean scores of 2133.333 in post test in Physical Exercises group, the Vital Capacity pre test mean score is 1971.111 which has also increased to the mean scores of 2271.111 in pranayama group, whereas among subjects of the pre and post trial of control gathering mean scores of Vital Capacity are 1902.222 & 1931.111.

The above table explains Pranayama group (M = 2271.111) was enhanced Vital Capacity than Pranayama+Physical Exercises, Physical Exercises and Control groups (M=2240.000, 2133.333 and 1931.111 respectively) after training.

The mean estimations of control and trial assemblies on Vital Capacity were graphically spoken to in Fig.1.

**Fig.1**

Graph showing comparison of Pre and Post Test Mean Scores of Vital Capacity among control and experimental groups.



## 2. Cardiovascular Endurance [Harvard Step Test]

The data on cardiovascular endurance before and after the Pranayama and Physical Exercises, Physical Exercises and Pranayama training of exploratory and control gatherings were examined and exhibited in Table -2.

**Table-2**

**Table showing paired sample statistics for Cardiovascular Endurance.**

Group	Test	N	Mean	Standard Deviation
Pranayama + Physical Exercises Group	Pre Test	45	68.333	6.620
	Post Test	45	73.038	8.031
Physical Exercises Group	Pre Test	45	66.193	6.900
	Post Test	45	74.878	6.849
Pranayama Group	Pre Test	45	67.849	7.633
	Post Test	45	70.927	6.495
Control Group	Pre Test	45	66.164	1 1.306
	Post Test	45	67.760	9.490

From the above table-2, it is observed that in experimental groups the Cardiovascular Endurance pre test mean score is 68.333, which has increased to the mean scores of 73.038 in post test in Pranayama + Physical Exercises group, the Cardiovascular Endurance pre test mean score is 66.193, which has increased to the mean scores of 74.878 in post test in Physical Exercises group, the Cardiovascular Endurance pre test mean score is 67.849 which has also increased to the mean scores of 70.927 in

pranayama group, whereas among subjects of control aggregate the pre test and post tests mean scores of Cardiovascular Endurance are 66.164 and 67.760 separately.

It likewise saw from the above table that Physical Exercises group (M=74.878) was better Cardiovascular Endurance than Pranayama + Physical Exercises, Pranayama and Control groups (M=73.038, 70.927 and 67.760 respectively) after training.

The mean estimations of control and test gathers on Cardiovascular Endurance were graphically spoken to in Fig.2.

Fig.2

Graph showing comparison of pre and post test mean scores of Cardiovascular Endurance among control and experimental groups.

### **CONCLUSION**

In light of the discoveries of the study the conclusions have been made as below:

1. It was concluded that Physical Exercises and Pranayama + Physical Exercises groups showed a significant improvement in agility after training among secondary school children.
2. It was concluded that Pranayama and Pranayama + Physical Exercises groups showed a significant improvement in vital capacity after training among secondary school children.
3. It was concluded that Physical Exercises and Pranayama + Physical Exercises groups showed a significant improvement in cardiovascular endurance after training among secondary school children.
4. Physiological variable vital capacity whereas the combined i.e. pranayama + physical exercises training had much impact in developing speed & reaction and rest of all other criterion variables of the study.

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