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Effect of pranayama on cardio-vascular endurance

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Abstract
The main purpose of the study was the effect of Pranayama on cardio-vascular Endurance. The subjects would be selected from the Patanjali Yogpeeth of Yog Kendra, Amravati, 40 male was act as the source of data. Forty male subjects of Patanjali Yogpeeth of Yog Kendra, Amravati, would be selected by purposive sampling method as the subjects for this study. The subject would be divided in two groups consisting of 20 subjects each, based on initial test. In two groups, the group 'A' would be experimental and group 'B' would be control group. The groups were assigned as Experimental Groups-A and control group-B respectively. Pre tests were conducted for all the subjects on selected physiological variable such as Cardio- Respiratory Endurance. Cardio- Respiratory Endurance would be measure by administrating Harvard step test. Statistical analysis would be done on the basis of data collection. The data pre-test and post-test would be compared by using 't' test and as per the result would be analyzed and interpretation would be done. The level of significance would be kept at 0.05 to test the hypothesis. Result: There is significant difference in cardio-vascular endurance of experimental group between pre and posttest. Six week yoga training programme shows positive effects on cardio-vascular endurance. There is no significant difference in cardio-vascular endurance of control group between pre and posttest. There is no significant difference in cardio-vascular endurance of pretest between experimental and control groups. There is significant difference in cardio-vascular endurance of posttest between experimental and control groups.

Keywords: Pranayama, Cardio-vascular endurance

1. Introduction
As a Physical Educationist and a Lover of Yoga' the research Scholar wanted to verify and to establish the facts regarding yogic principles that claims to have beneficial effect on the physiological parameters, especially on vital capacity, Hemoglobin and Respiratory Endurance. First the research scholar wants to clarify and nullify the misconceptions that cloud the Indian minds. Yoga has an eight-fold path for perfection, namely, yama, niyama, asana, pranayama, prathihara, dharana, dhyana and samadhi. Indians as well as foreigners have several misconceptions about yoga as a whole or Pranayama in particular. One who aspires to understand and practice Yoga or Pranayama must first get himself cleaned of the misconceptions that are prevalent now. Most of the people think that Yogic practice such as Pranayama is for only those who have secluded themselves from worldly activities. Such a misconception is spread either by those who practiced pranayama or Meditation with half-mind or those who were not benefited or by those who were pessimistic about them. There is an irrational belief that one who likes to practice Pranayama must first fulfill certain strict rules and regulation. These rules and regulations cannot be followed by one who is a householder. So people believe that Pranayama is not for a house-holder. With the help of a good guide, anybody can easily follow the simple rules and regulations of Pranayama. An individual, who travels in a train or an air-craft and who always thinks about the train accidents and crash of air-crafts, cannot reach this destination peacefully. Similarly, people think always about the dangers that are involved in practicing Pranayama. The dangers are due to wrong understanding and misapplication of these Yogic systems. A good teacher in Pranayama can help his disciple to learn and practice properly.

Patanjali divided the Yoga system into eight path namely, yama, niyama, asana, pranayama, prathihara, dharana, dhyana and samadhi on the basis of the intellectual grasping power of individuals [1]. People wrongly think that they are arranged step by step, namely, one must first master yama, to practice niyama, or one must master niyama to practice asana and so on. The reality behind it is that one who follows either yama or niyama or asana or any one of the eight-fold paths can attain the ultimate goal of self-realization. For example one who follows yama only sincerely and earnestly cannot only attain the final goal but also derive the benefits of the other seven-fold paths.

People believe that Pranayama gives super-natural powers. Practitioners of Pranayama attain super physical strength such as stopping a moving motor vehicle or eating glass pieces, nails or thorns, or drinking poison etc. But in reality such super-natural powers are not the real aims of yogic systems. Theses extra-ordinary feats belong to black magicians. But scientific experiments are carried out to clear this misconception.

People wrongly believe that the practitioners of Pranayama can feel warm or cold, whenever he wants to feel so. But actually what happens is that one who practices Pranayama may adjust himself to the outside temperature and thereby can escape from the adverse effects of such environmental changes. Yoga practices such as Pranayama can keep an individual hale and healthy. The purpose of Pranayama is to purify the nerves and thereby to strengthen the nervous system. It is as easy to do as it is useful. Increase its duration gradually after attaining the concentration of mind.

Pranayama means control and regulation of breath [2]. 'Prana' is a Sanskrit word which means 'vital force'. It also signifies 'life' or breath. 'Ayana' means the control of the prana so pranayama means the control of the vital force (prana) by concentration and regulated breathing. Prana is the vital power of force which is motivating every element on the earth and is the origin of the force of thought. There is a deep affinity between prana and mental force, between mental force and intellect, between intellect and soul, and between soul and God. The prana not only ensures the proper functioning of the body (including the glandular system), but is also the regulator and animator of the psyche. It is remedy for several physical and psychic disturbances of which modern man is the victim. In all forms of life, form the highest to the lowest, the prana is present as a living force. All the force is bared on prana. It is the origin of movement, gravity, magnetism, physical action, the nerve currents and the force of the thought. Without prana there can be no life, for it is the soul of all force and energy. It is found in the air, water and food. Prana is the vital force inside each living being, and thought is the highest and most refined action of prana. As we breathe, the movement of the lungs in haling air is the expression of prana. Pranayama is not simply the breathing but the control of the muscular force activating the lungs.

The control of prana through the concentration of thought and regular breathing is called 'pranayama'. It is through pranayam that each part of the body can be filled with prana. Once one is capable of performing it, one is master of the body and can dominate illness and Suffering. Prana is accumulated where our mind is concentrated. Thought is the absolute master controlling prana-energy. Just as we are able to make ourselves ill and weak by thinking wrong and negative thoughts, so we cure ourselves by expelling bad thoughts and replacing them with positive ones. It is the essential factor in our lives. It is a basic necessity for the safeguard of our health.

As a wind drives smoke and impurities from the atmosphere, Pranayama drives away the impurities of the body and mind.

Physiological values of pranayama:

1. Pranayama affects the nerves and tones the entire system,
2. It increase digestive power, invigorates the nerves and cleans the sinuses,
3. The blood receives a larger supply of oxygen, one feels refreshed. The nerves are calmed and purified,
4. Pranayama activate and invigorate the liver, spleen, pancreas and abdominal muscles,
5. The sinuses are drained and the eyes feel cool,
6. Pranayama cool the system and soothe the eyes and ears,
7. Is benefits person suffering from low blood pressure and high blood pressure?
8. It keeps the body fit & healthy,
9. One can live a long life with pranayama. It improves the power of memory and eliminates mental disorder,
10. It Purifies tabular channels and removes sluggishness from the body,
11. The constant practice of pranayama strengthens the nervous system, the mind becomes calm and capable of concentration,
12. The constant practice of pranayama rouses spiritual power. It gives spiritual joy, spiritual light and mental peace,
13. It clears the skull, the respiratory system and nasal cavities,
14. It eliminates the cough accumulated in the wind piple, and cure the asthma,
15. It tones up the heart and activates the respiratory system, and the circulatory system,
16. It purifies the blood.

1.1 Statement of the problem

Effect of Pranayama on cardio-vascular endurance

1.2 Purpose of the study

To find out the effect of Pranayama on cardio-vascular Endurance

2. Methodology

2.1 Sources of data

The subjects would be selected from the Patanjali Yogpeeth of Yog Kendra, Amravati, 40 male was act as the source of data.

2.2 Selection of data

Forty male subjects of Patanjali Yogpeeth of Yog Kendra, Amravati, would be selected by purposive sampling method as the subjects for this study. The subject would be divided in two groups consisting of 20 subjects each, based on initial test. In two groups, the group 'A' would be experimental and group 'B' would be control group.

2.3 Experimental Design

The groups were assigned as Experimental Groups-A and control group-B respectively. Pre tests were conducted for all the subjects on selected physiological variable such as Cardio-Respiratory Endurance.

2.4 Criterion measures

Cardio- Respiratory Endurance: Cardio- Respiratory Endurance would be measure by administrating Harvard step test.

Table 1: Training schedule

Day/Week	Name of Pranayama	Duration
Monday to Saturday	Om kar jaap	5 minutes
	Rest	30 seconds
	Kapalbhati	5 minutes
	Rest	30 seconds
	Anulom-vilom	5 minutes
	Rest	30 seconds
	Bhastrika	5 minutes
	Rest	30 seconds
	Bhramari	4 minutes
	Rest	30 seconds
	Sheetali	3 minutes
	Sitkari	3 minutes
	Rest	30 seconds
	Ujjayi	7 minutes
	Yognidra	10 minutes
Total Duration		50 minutes

2.5 Statistical analysis

Statistical analysis would be done on the basis of data collection. The data pre-test and post-test would be compared by using‘t’ test and as per the result would be analyzed and interpretation would be done. The level of significance would be kept at 0.05 to test the hypothesis.

Table 2: Caparison of cardio-vascular endurance between pre and posttest of experimental group.

Group	Test	Mean	SD	SE	MD	O `t'	T `t'
Experimental Group	Pre	66.156	4.717	1.371	8.132	5.933*	2.02
	Post	74.288	3.915				

Level of Significance = 0.05, Tabulated‘t’ 0.05 (38) = 2.02

Table No. 2: reveals that there is significant difference in cardio-vascular endurance of experimental group between pre and posttest. The obtained t-value of 5.933 is more than the table value of 2.02.

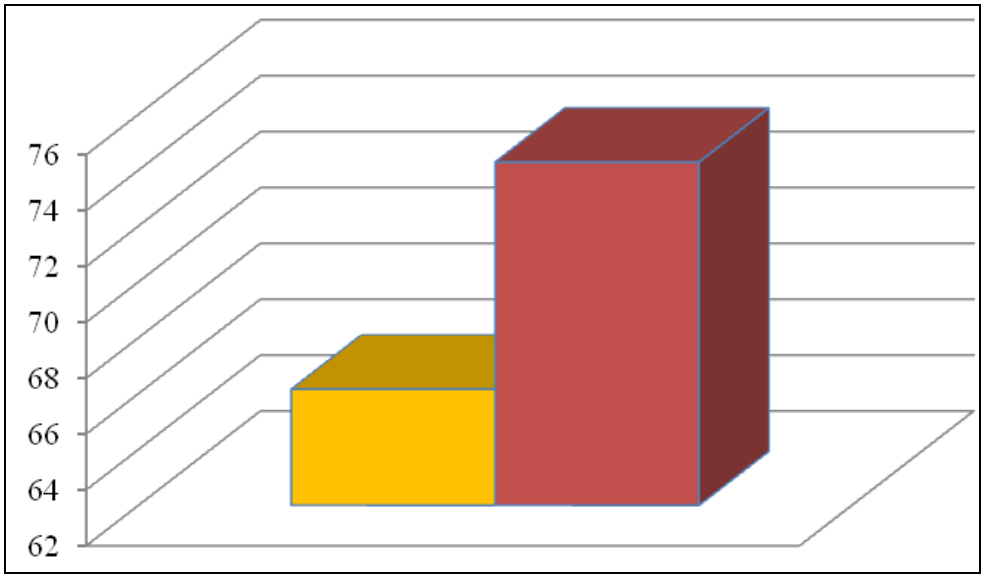

Fig 1: Mean value of pre and post cardio-vascular endurance of experimental group

Table 3: Caparison of cardio-vascular endurance between pre and posttest of control group

Group	Test	Mean	SD	SE	MD	O `t'	T `t'
Control Group	Pre	68.262	7.643	2.227	1.092	0.490	2.02
	Post	69.353	6.388				

Table No. 3: reveals that there is insignificant difference in cardio-vascular endurance of control group between pre and posttest. The obtained t-value of 0.490 is less than the table value of 2.02.

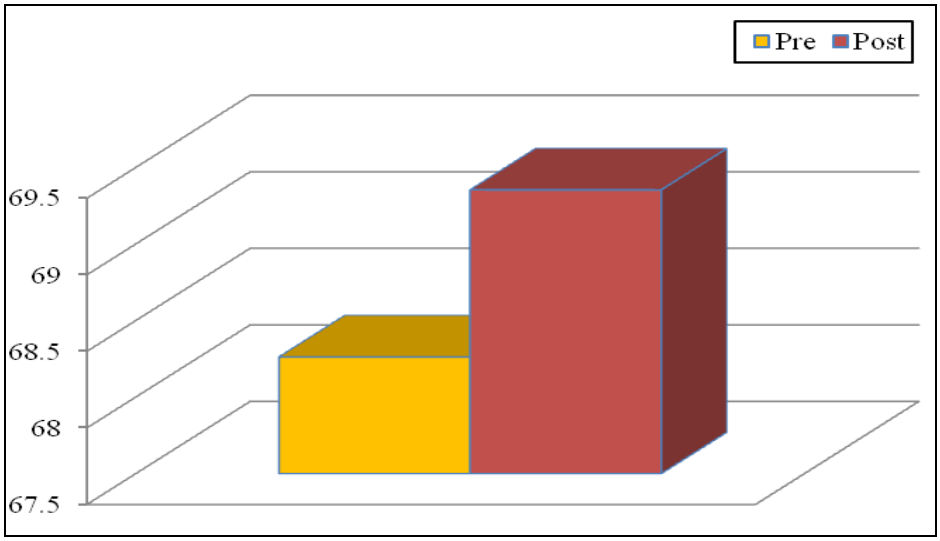

Fig 2: Mean value of pre and post cardio-vascular endurance of control group

Table 4: Caparison of cardio-vascular endurance between experimental and control group of pre test

Group	Test	Mean	SD	SE	MD	O `t'	T `t'
Experimental	Pre	66.156	4.717	2.008	2.106	1.049	2.02
Control	Pre	68.262	7.643				

Table No. 4: reveals that there is insignificant difference in cardio-vascular endurance of pretest between experimental and control group. The obtained t-value of 1.049 is less than the table value of 2.02.

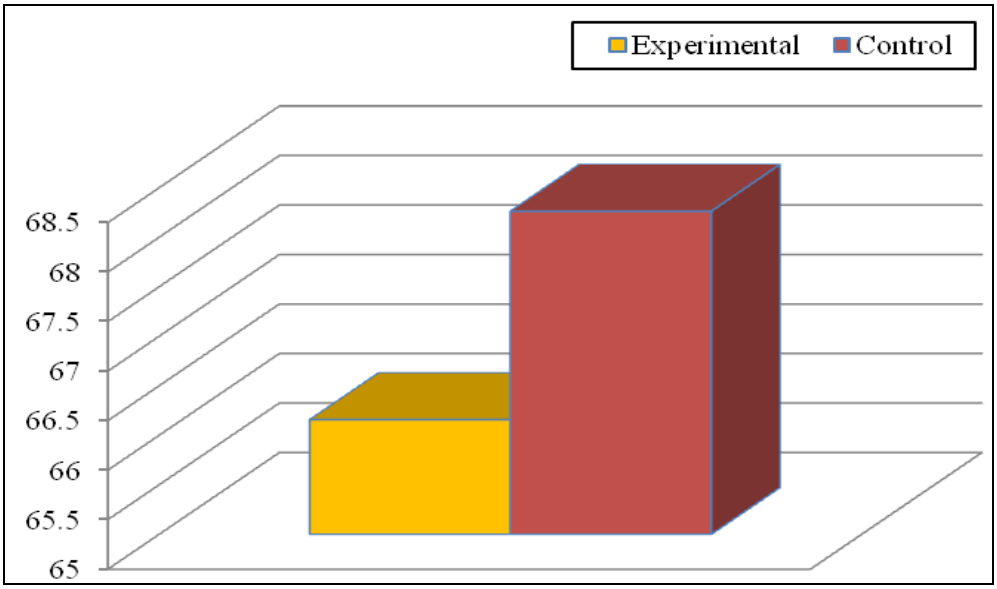

Fig 3: Mean value of cardio-vascular of experimental and control group in Pretest endurance

Table 5: Caparison of cardio-vascular endurance between experimental and control group of posttest.

Group	Test	Mean	SD	SE	MD	O `t'	T `t'
Experimental	Post	74.288	3.915	1.675	4.935	2.945*	2.02
Control	Post	69.353	6.388				

Table No. 5: reveals that there is significant difference in cardio-vascular endurance of posttest between experimental and control group. The obtained t-value of 2.945 is more than the table value of 2.02.

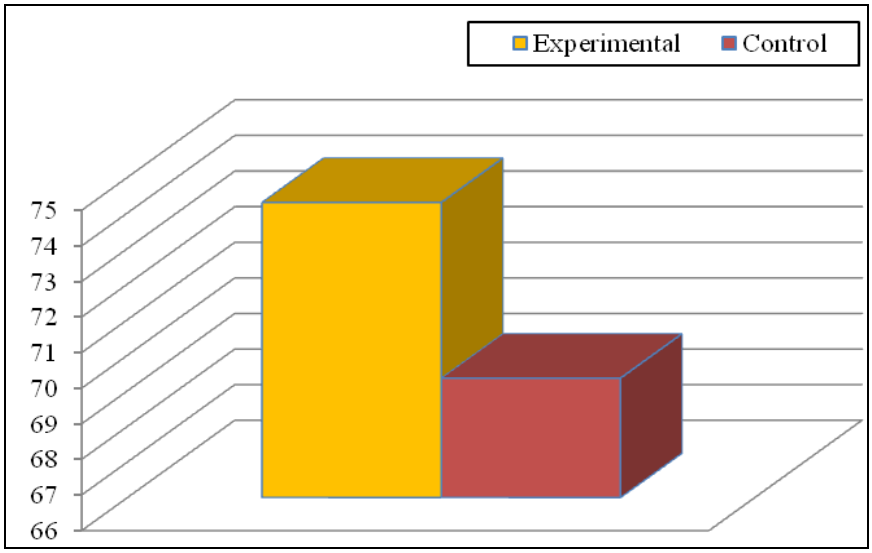

Fig 3: Mean value of cardio-vascular endurance of experimental and control group in Post test

3. Conclusion

The results and findings can be discussed with the help of the following points:

1. There is significant difference in cardio-vascular endurance of experimental group between pre and posttest. Six week yoga training programme shows positive effects on cardio-vascular endurance.
2. There is no significant difference in cardio-vascular endurance of control group between pre and posttest.
3. There is no significant difference in cardio-vascular endurance of pretest between experimental and control groups.
4. There is significant difference in cardio-vascular endurance of posttest between experimental and control groups.

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